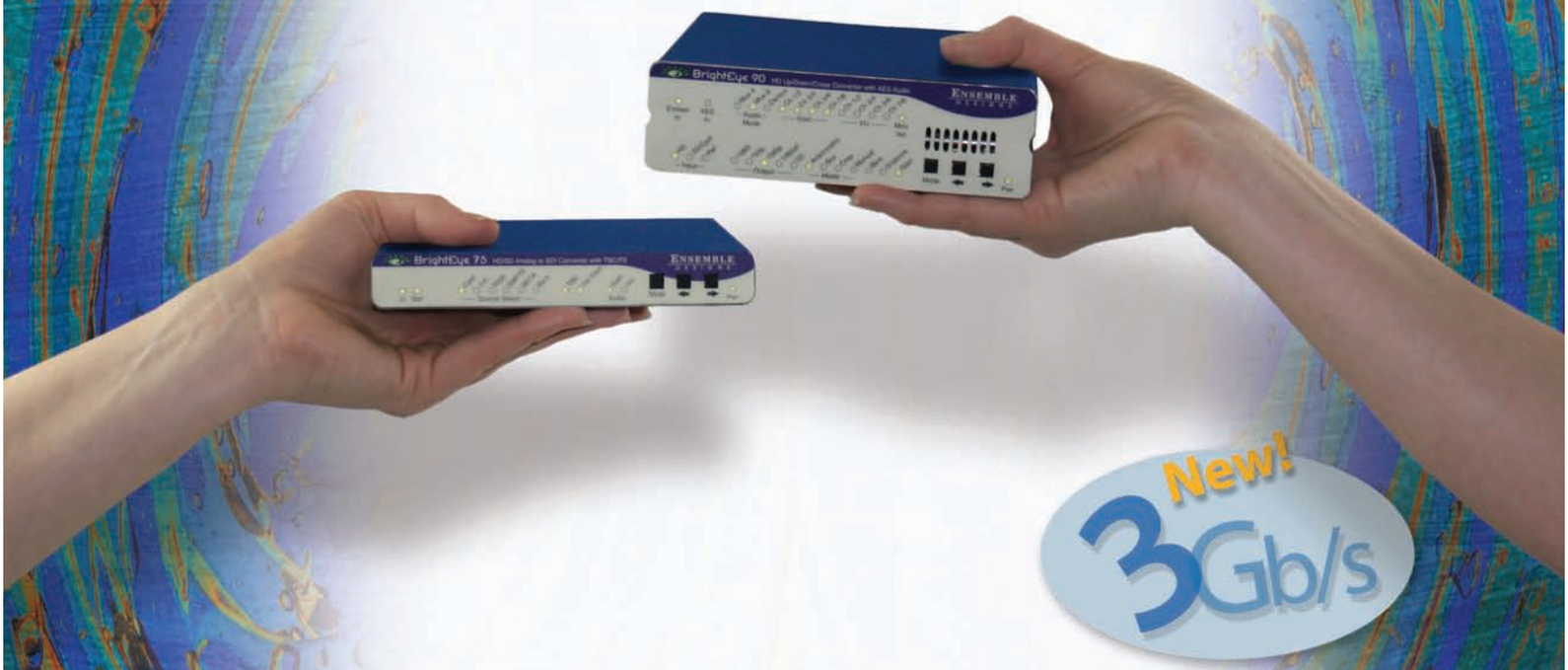
# BrightEye™

## Compact Video, Audio and Optical Converters

Product Catalog 2009




New! 3Gb/s

**Purveyors of Fine Video Gear – Loved by Engineers Worldwide**

ENSEMBLE DESIGNS

# Who is Ensemble Designs?

### By Engineers, For Engineers

In 1989, a former television station engineer who loved designing and building video equipment, decided to start a new company. He relished the idea of taking an existing group of equipment and adding a few special pieces in order to create an even more elegant ensemble. So, he designed and built his first product and the company was born.

### Focused On What You Need

As the company has grown, more former TV station engineers have joined Ensemble Designs and this wealth of practical experience fuels the company's innovation. Everyone at the company is focused on providing the very equipment you need to complete your ensemble of video and audio gear. We offer those special pieces that tie everything together so that when combined, the whole ensemble is exactly what you need.

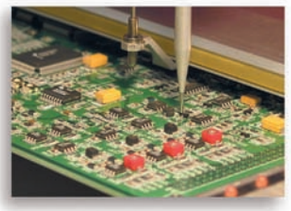
### Notably Great Service

We listen to you – just tell us what you need and we'll do our best to build it. We are completely focused on you and the equipment you need. Being privately held means we don't have to worry about a big board of directors or anything else that might take attention away from real business. And, you can be sure that when you call a real person will answer the phone. We love this business and we're here to stay.

### Bricks and Mortar of Your Facility

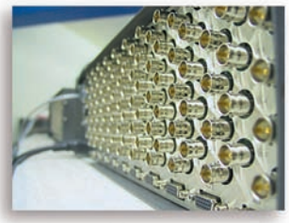
The bricks and mortar of a facility include pieces like up/downconverters, audio embedders, video converters, protection switches and SPGs for SD, HD and 3Gb/s . That's what we're focused on, that's all we do – we make proven and reliable signal processing and infrastructure gear for video facilites worldwide, for you.

*BrightEye — palm sized video and audio conversion, HD up/down conversion and test signal generators with 3G, HD, SD, ASI video, audio and optical choices.*



*Everything is made at our factory in Nevada City, California.*

*Shipped with care to video facilities all over the world.*



*And consider our Avenue product line when you need a modular system.*

*Come on by and visit with us. Drop in for lunch and a tour!*

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AES Audio | | | | | | | | | | ✦ | ✦ | ✦ | | | | | ✦ | ✦ | | ✦ | |
| Analog Audio | | | | | | | | | ✦ | ✦ | | | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | | | |
| Demux | | | | | | | | | ✦ | ✦ | | ✦ | | ✦ | | | | | | | |
| Mux | | | | | | | | | | ✦ | ✦ | | ✦ | | ✦ | ✦ | | | | | |
| HDMI Out | | | | | | | | | | | | | | | | | | | | | |
| Optical Out | ✦ | | | | | | | | | | | | | | | ✦ | | | | | |
| Optical In | | | | | ✦ | | | | | | | | | | | | | | | | |
| Ref In/Timeable Out | ✦ | | ✦ | ✦ | | | | ✦ | ✦ | | | | | | ✦ | ✦ | ✦ | ✦ | | | |
| TBC/frame sync | ✦ | | ✦ | ✦ | | | | ✦ | ✦ | | | | | | ✦ | ✦ | | | | | |
| HD Analog Component Out | | | | | | | ✦ | | | | | | | | | | | | | | |
| HD Analog Component In | | | | | | | | | | | | | | | | | | | | | |
| SD Analog Component Out | | | | | ✦ | ✦ | ✦ | | | | | | | | | | | | | | |
| SD Analog Component In | ✦ | ✦ | ✦ | | | | | | | | | | | | | | | | | | |
| Analog Composite Out | | | | ✦ | ✦ | ✦ | ✦ | | | | | | | ✦ | | | | | | ✦ | |
| Analog Composite In | ✦ | ✦ | ✦ | ✦ | | | | | | | | | | | ✦ | ✦ | | | | ✦ | |
| 3 Gb/s HD SDI Out | | | | | | | | | | | | | | | | | | | | | |
| 3 Gb/s HD SDI In | | | | | | | | | | | | | | | | | | | | | |
| HD SDI Out | | | | | | | ✦ | | | | | | | | | | | | | | ✦ |
| HD SDI In | | | | | | | ✦ | | | | | | | | | | | | | | ✦ |
| ASI | | | | | | | | | | | | | | | | | | | | | ✦ |
| SD SDI Out | ✦ | ✦ | ✦ | | | ✦ | ✦ | | | ✦ | ✦ | ✦ | ✦ | | ✦ | ✦ | | | ✦ | | ✦ |
| SD SDI In | ✦ | | | | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | | | | | ✦ | | ✦ |

| | BrightEye 43 | BrightEye 45 | BrightEye 46 | BrightEye 47 | BrightEye 48 | BrightEye 54 | BrightEye 55 | BrightEye 56 | BrightEye 57 | BrightEye 70 | BrightEye 71 | BrightEye 72 | BrightEye 73 | BrightEye 74 | BrightEye 75 | BrightEye 76 | BrightEye 90 | BrightEye 90-A | BrightEye 90-F | BrightEye 90-FA | BrightEye 91 | BrightEye 91-A | BrightEye 92-A | BrightEye 92-M | BrightEye 92-MA | BrightEye 93 | BrightEye 94 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BrightEye 43 | ✦ | | ✦ | | ✦ | | | | ✦ | | | | | | | | | | | | | | | | | | |
| BrightEye 45 | ✦ | | ✦ | | ✦ | | | | | | | ✦ | | | | | | | | | | | | | | | |
| BrightEye 46 | ✦ | ✦ | ✦ | ✦ | ✦ | | | ✦ | ✦ | ✦ | ✦ | | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | | | | ✦ | |
| BrightEye 47 | ✦ | ✦ | ✦ | ✦ | ✦ | | | | | ✦ | ✦ | ✦ | ✦ | ✦ | | | ✦ | ✦ | ✦ | ✦ | ✦ | | ✦ | ✦ | ✦ | ✦ | |
| BrightEye 48 | ✦ | ✦ | ✦ | ✦ | ✦ | | | | | | | | | | | | | | | | | | | | | | |
| BrightEye 54 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | | | ✦ | | | | | ✦ | ✦ | ✦ | ✦ | | | ✦ | ✦ | ✦ | | ✦ |
| BrightEye 55 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 56 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | | |
| BrightEye 57 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 70 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 71 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 72 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 73 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 74 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 75 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 76 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 90 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 90-A | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 90-F | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 90-FA | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 91 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 91-A | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 92-A | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 92-M | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 92-MA | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 93 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |
| BrightEye 94 | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ | ✦ |

*Up to 6 BrightEye Units in 1RU*

- HD Up/Down/Cross Converters
- Video and Audio Converters
- TBCs and Frame Syncs
- Embedders/Disembedders
- 1.5 and 3G HD, SD, Audio, Optical, HDMI
- Sync Pulse Generator
- Small! Just 143 mm x 20 mm (0.58 kg) 5.7" x 0.8" (1.25 lbs)
- 5 Year Warranty

# Compact Video, Audio and Optical Converters

## Over 45 Units to Choose From

The BrightEye™ line of compact converters from Ensemble Designs is a complete conversion solution. With over 45 different BrightEye units to choose from, you'll find the right unit for your video processing needs. These self-contained converters interface to a full range of video formats: high definition and standard definition SDI, 3 Gb/s, analog component, analog composite, and Y/C (S-Video). Analog audio and AES digital audio converters and embedders round out the BrightEye family. Additionally, with fiber optic I/O choices, BrightEye can take you farther than any ordinary converter.

## Proven and Reliable

Whether you're upconverting analog video to HD for a projection system, converting a camera feed to fiber in an arena, or feeding HD Tri-Level Sync to a non-linear editor, BrightEye is there to help. With their multi-format inputs and outputs, BrightEye converters are the flexible and cost-effective answer to any conversion requirement. BrightEye's easy configuration interface and signal status indicators make it simple to install and troubleshoot a system.

## BrightEye Mac and PC software

Adjusting video levels, output timing and mixing audio channels are so easy with BrightEye control software. No DIP switches or button hold-downs are needed. Use BrightEye Mac or PC software to control a single BrightEye unit or any number of units connected to a USB hub. Additionally, you can use it to upgrade BrightEye units as new software versions become available. BrightEye Mac and PC software are included with each unit at no charge.

## Used Worldwide

Their compact size lets you put conversion right where it's needed: in a remote truck, on a helicopter or in a TV station. Reliable and easy to install, these units make your transition to HD simple. And they're affordable too!

## A Complete 3G Signal Chain

For facilities and manufacturers using 3 Gb/s video, BrightEye units can be combined to form a complete 3G signal chain. The BrightEye 57 test signal generator's 3G output can be distributed through the BrightEye 43 3G distribution amplifier or the BrightEye 46 and BrightEye 48 E/O 3G fiber optical transmitter/receiver set.

For facilities using 3G the issue of monitoring the signal becomes a challenge. The BrightEye 72 is an HD/SD/3G digital to analog video converter with an HDMI confidence monitor out that provides a convenient way to monitor any type of digital video signal. A 3G video signal can be easily viewed via the HDMI output.

*BEPS*

.26 kg

*BEPS6*

.37 kg

.34 kg

*Order Info*

| | |
|---|---|
| **BEPS** | BrightEye Individual Power Supply |
| **BEPS6** | Spider Power Supply powers 6 single high BrightEyes or 3 double high BrightEyes (BrightEye 90 family) |
| **BEPS6-RP** | Redundant Power Supply for Spider |
| **BERKMT** | BrightEye™ Rack Mount (holds 3 to 6 BrightEyes) 1RU. 6"/152.4 mm deep, 3 lbs/1.4 kg |
| **BEBP** | BrightEye Blank Panel (single high, for empty slots in Rack Mount) |
| **BEAC** | Analog Audio Breakout Cable |

# Fiber Optic Interfaces

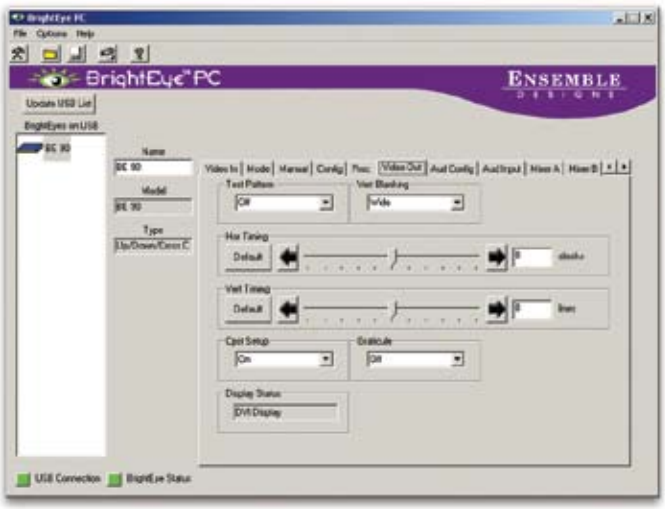
When distances take you beyond the reach of ordinary copper cable, look to BrightEye's fiber optic interfaces. With both laser diode fiber drivers and photo diode receivers, BrightEye can handle both ends of a fiber optic link. Fully compliant with SMPTE 274M, 296M and 297M, BrightEye's optical interfaces operate at a wavelength of 1310 nm. Integral SC type connectors make it easy to connect into fiber infrastructure. BrightEye has been designed without internal fiber pigtails, so all optical converters support both multi and single mode fiber. BrightEye's fiber interconnect carries the same digital bitstream that makes up the electrical SDI interface. Data is carried by pulses of light rather than pulses of electricity. This rugged transmission system can carry serial digital signals with no loss or degradation for twenty kilometers or more on single mode fiber. With the use of a launch attenuator, multimode fiber is supported.

BrightEye makes it easy to take advantage of fiber optic technology. Choose from converters that include analog video I/O or units that interface directly to HD or SD SDI signals. Fiber interfaces are ideal for outdoor events and remote broadcasts. Fiber is not only a great solution for long distances, but since it is electrically non-conductive it also provides complete electrical isolation between the two connection points. Fiber connectivity completely eliminates concern for AC ground loops and hum. Optical transmission over fiber is also immune to radio frequency interference (RFI) and electromagnetic interference. Even nearby lightning strikes will not compromise the signal.

# BrightEye Mac and PC Software

Adjusting video levels, output timing and mixing audio channels are so easy with BrightEye control software. No DIP switches or button hold-downs are needed. Use BrightEye Mac or PC software to control a single BrightEye unit or any number of units connected to a USB hub. Additionally, you can use it to upgrade BrightEye units as new software versions become available. BrightEye Mac and PC software are included with each unit at no charge.

*PC Screen Shot*




*Mac Screen Shot*

BrightPak™

# Portable, Rugged Field Kit for BrightEyes

Use this sturdy, portable case with BrightEyes in the field. This rugged case makes it convenient to have upconverters, sync pulse generators, fiber transmitters and more wherever you need them.

BrightPak is modular and that means all BrightEyes, from the BrightEye 90-F HD Up/Down/Cross Converter with Fiber to the BrightEye 55 Sync Pulse Generator, can be housed in BrightPak for easy transport and use. You can optimize BrightPak for your specific application.

- Field acquisition
- Field HD source
- Telco kit
- Field reporting
- Mobile applications

## BrightPak Integration

BrightPak Basic in Kit Form is intended for end-users, dealers, distributors, and system integrators who wish to configure a BrightPak for a specific use. By selecting the appropriate BrightEye converters, industry standard connectors, and providing internal cabling, a BrightPak can be created that has the exact features and functions needed for a specific application. BrightPak Basic in Kit Form is a starting point for that process – providing the ruggedized field case, mounting for BrightEye converters and connectors, and power system needed. It is a framework for BrightPak integration.

*A flexible field case that lets you take video converters, SPGs, and optical transmitters anywhere.*

*On location, it's the interface point for picture, sound, and communication.*

*When equipped with bi-directional fiber, BrightPak supports outbound sound and picture, with return video, sound, and ifb.*

# Easily Configured For Your Needs in the Field

*Built from a tough, Pelican case, it will stand up to a lot of abuse.*

*Configure the versatile connector bay to provide exactly the inputs and outputs you need.*

### Pelican 1430 Top Loader Case

Modified with side opening for connector bay and Anton/Bauer Battery Gold Mount.

### Machined aluminum top plate and framework

Provides mounting for up to 6 single high BrightEyes, or three double high BrightEyes (or combination). Includes one single high and two double high blank plates.

### Power and Control System

100-230 VAC 50/60Hz universal power supply suitable for worldwide operation. Automatic detection/selection of AC versus battery power (BrightPak is not a charger for the battery). BrightPak will switch automatically to battery if the AC power is lost – without any on-air glitch or interruption. IEC power connection installed in the connector side bay. Power on/off switch, AC/Battery indication, and Low Battery Indicator on top plate. Internal fan-out connections of 12 volt power for use with BrightEyes and/or other user-supplied devices. Internal USB Hub with Neutrik 'D' type USB connector. USB connector can be installed in connector side bay or on top plate as desired.

### Connector Support

- Connector bay on side of BrightPak provides openings for:
  - 1 IEC AC power input connector (internally connected to power system)
  - 12 Neutrik/Switchcraft 'D' type connector positions (connectors not included)
  - 1 Mounting position for Stratos HMA Flange mount expanded beam optical connector (connector not included)
- Connection positions on top plate of BrightPak provide:
  - 6 Neutrik/Switchcraft 'D' type connector positions (connectors not included)

### Battery Mount

- Includes an Anton/Bauer Gold Mount Battery connector plate installed on side of case and wired into power system. Suitable for use with all Anton/Bauer batteries. Does not include battery. Mounting systems for alternate batteries available upon request. Typical operating time with a high capacity battery, one BrightEye 90-F, one BrightEye 47, and one BrightEye 24, is three to four hours.

### Control Video and Audio Parameters

- The BrightPak Basic Kit includes a "D" mount USB connector, an internal USB hub, and all cables needed to support three BrightEye units. The USB connector can be installed in either the side bay or on the top plate. A laptop connected to that connector will have full control over all of the BrightEye units.

*Order Info*

| | |
|---|---|
| **BEPAK** | BrightPak Basic – Portable, Rugged Field Case for BrightEyes. Comes in Kit Form |
| **BEPAKEXT** | BrightPak Basic Extension Kit |

**BrightPak Basic includes:**

Hardware to install 3 BrightEyes

Pelican 1430 Top Loader Case

Machined aluminum top plate, blanks, framework

Power and Control System

Anton/Bauer Gold Battery Mount

Neutrik "D" Mount USB Connector

6 Mounting Blocks for BrightEye (2 per BrightEye)

4 USB type A-B Cables

AC Line Cord

3 Power Cables for BrightEye

**BrightPak Basic Extension Kit includes:**

Hardware to install 3 additional BrightEyes

3 USB type A-B Cables

6 Mounting Blocks for BrightEye (2 per BrightEye)

3 Power Cables for BrightEye

**Additional Items:**

BrightEye converters, audio/video/fiber connectors, internal cabling, and other non-Ensemble accessories are not part of the BrightPak Basic. They are shown here to demonstrate the full range and capability of the BrightPak system. Additional connectors can be ordered from companies such as Neutrik, Switchcraft, and Stratos.

*Modular design makes configuration easy. The entire assembly removes from the case for cabling.*

*Up/Down/Cross Conversion, Fiber Tx and Rx, A to D, D to A, Audio Embedding, Bar Generator with Slate – just choose the functions you need. D to A, Audio Embedding, Bar Generator with Slate, just choose the functions you need.*

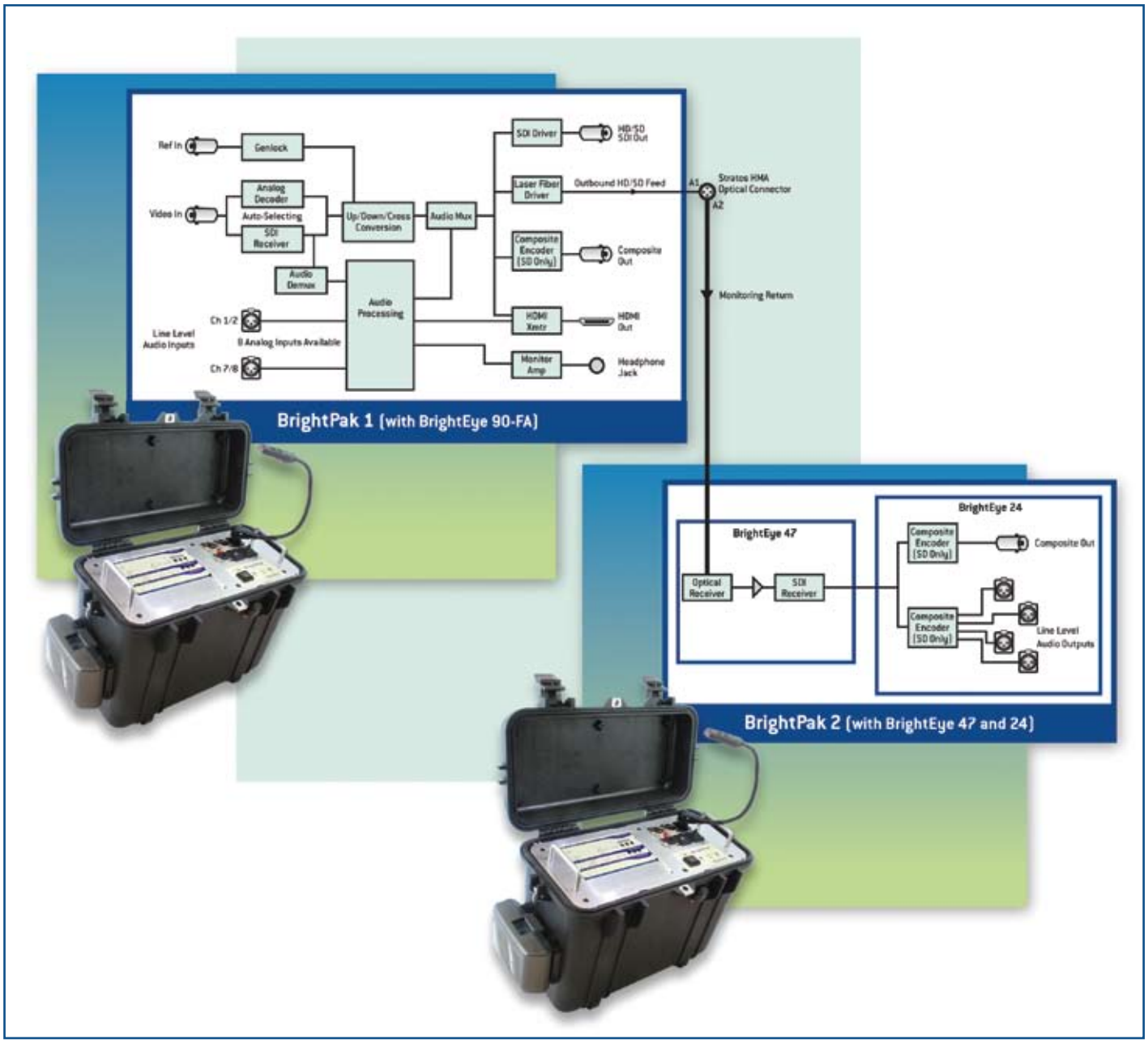
*Accepts wide range of industry standard connectors and accessories allowing total customization.*

*Automatically detects and switches seamlessly to AC Power when available.*

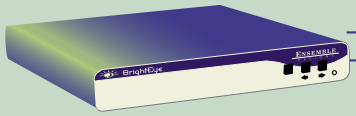
***Field News Acquisition***

In this example two BrightPaks are used for outdoor, field news acquisition. One BrightPak is populated with a BrightEye 90-FA Up/Down/Cross Converter and is processing an HD or SD camera feed. The BrightEye 90-FA upconverts or cross converts the signal as needed to the desired HD format. For example, if the desired output is 720p, any input delivered to the BrightEye 90-FA (SD or HD) would be converted to 720p. Audio levels and video levels can be adjusted.

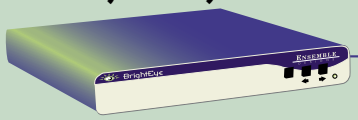
The BrightEye 90-FA's outbound fiber feed goes to a second BrightPak in another location. This second BrightPak is populated with a BrightEye 47 Optical to Electrical Converter and BrightEye 24 D to A Converter. The incoming optical feed comes into the BrightEye 47 and is converted to electrical (HD or SD on standard coax) for signal monitoring and distribution. This electrical signal feeds the BrightEye 24, where the signal is demuxed into SDI, composite and analog audio for monitoring purposes.



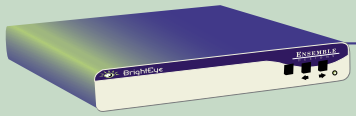
## BrightEye 1



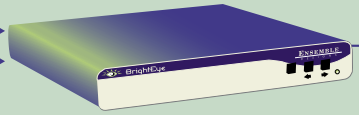

## BrightEye 2



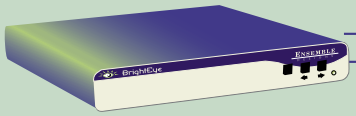

## BrightEye 3



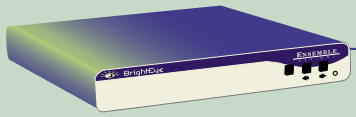

## BrightEye 5



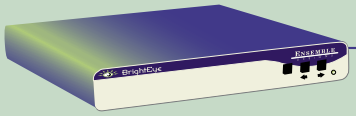

## BrightEye 10



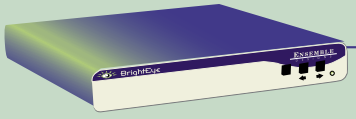

## BrightEye 11



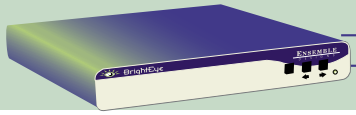

## BrightEye 11-HD

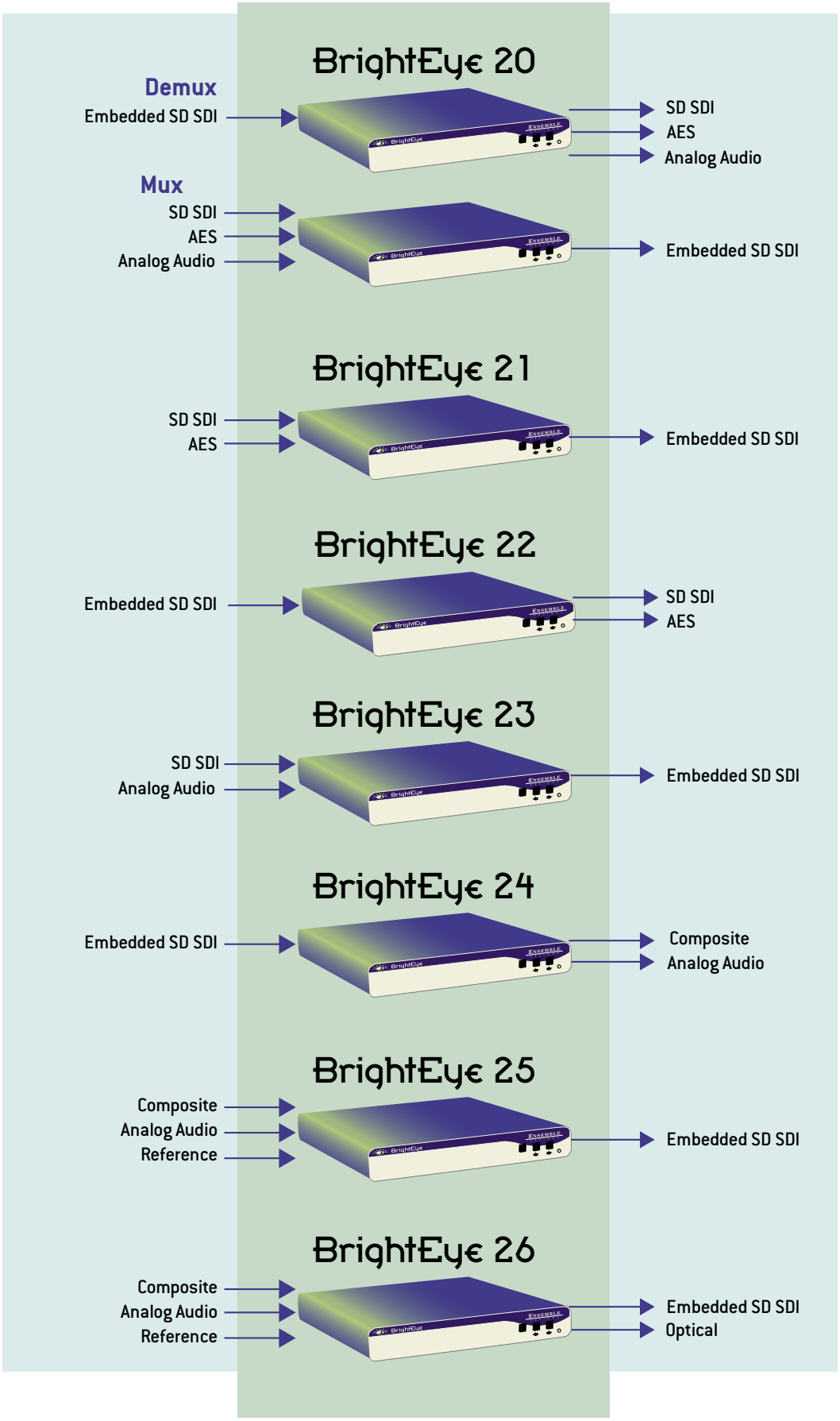



## BrightEye 15

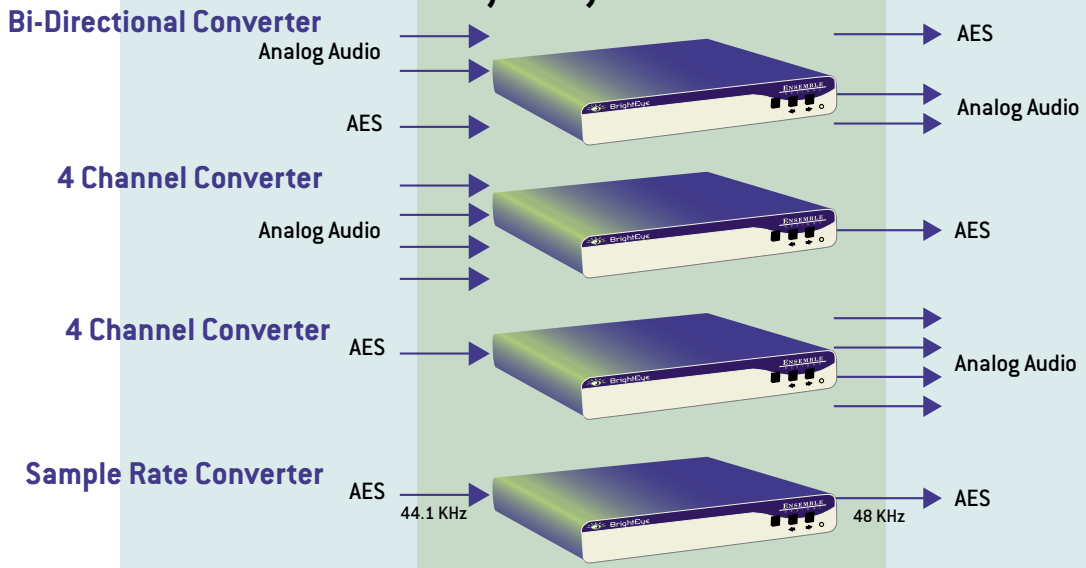



## BrightEye 16

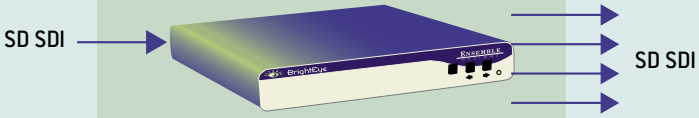



BrightEye 20
Demux
Embedded SD SDI
SD SDI
AES
Analog Audio
Mux
SD SDI
AES
Analog Audio
Embedded SD SDI
BrightEye 21
SD SDI
AES
Embedded SD SDI
BrightEye 22
Embedded SD SDI
SD SDI
AES
BrightEye 23
SD SDI
Analog Audio
Embedded SD SDI
BrightEye 24
Embedded SD SDI
Composite
Analog Audio
BrightEye 25
Composite
Analog Audio
Reference
Embedded SD SDI
BrightEye 26
Composite
Analog Audio
Reference
Embedded SD SDI
Optical

## BrightEye 30 and 30-D

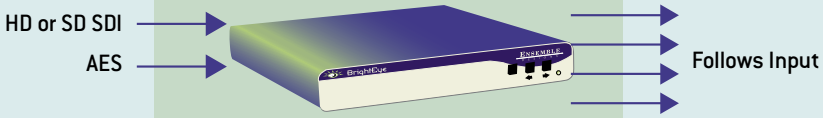



## BrightEye 40

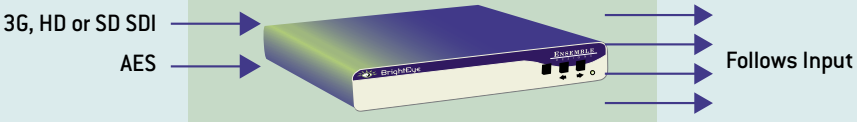



## BrightEye 41

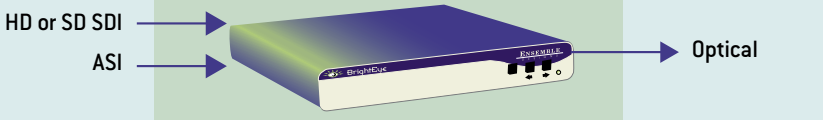
## BrightEye 42




## BrightEye 43




## BrightEye 45



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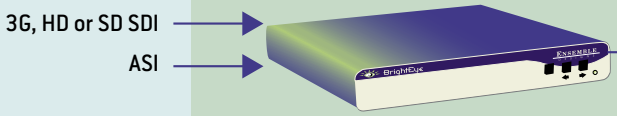


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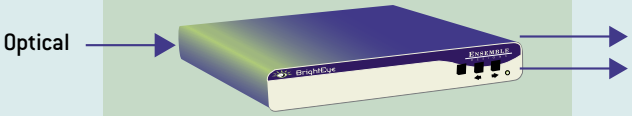


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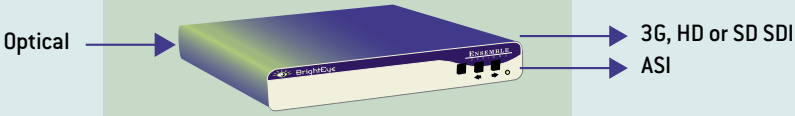


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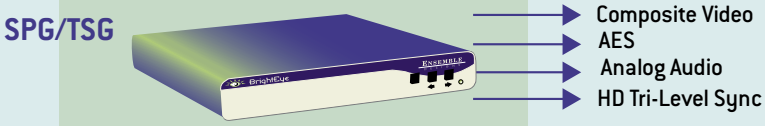
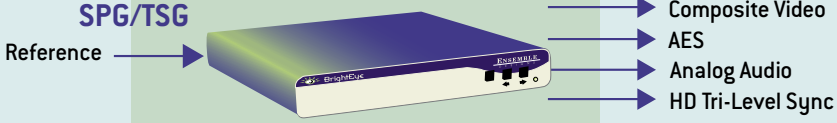
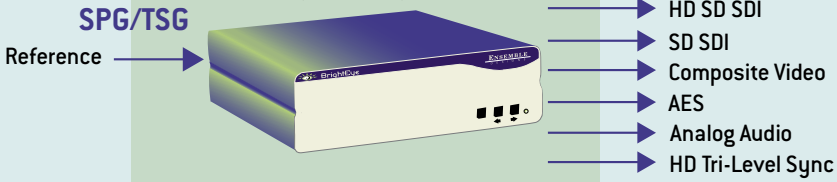



## BrightEye 55




## BrightEye 56

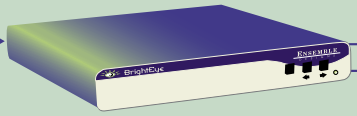



## BrightEye 57

## BrightEye 70

**Demux**

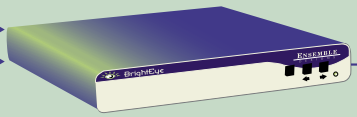
Embedded SDI
HD or SD



SDI
AES

**Mux**

HD or SD SDI
AES

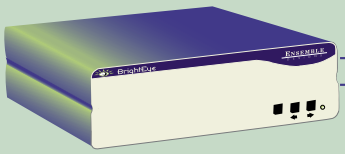


Embedded SDI

## BrightEye 71

**Demux**

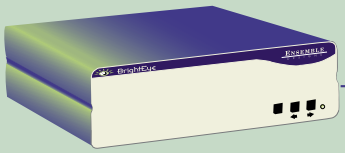
Embedded SDI
HD or SDI



SDI
Analog Audio (8 ch)

**Mux**

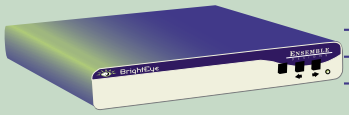
HD or SD SDI
Analog Audio (8 ch)



Embedded SDI

## BrightEye 72

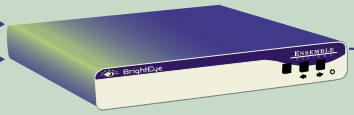
3G, HD or SD SDI



HD YPrPb, HD RGB
SD YPrPb, SD RGB
HDMI

## BrightEye 73

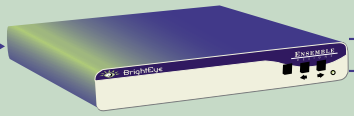
HD or SD SDI
AES



Optical

## BrightEye 74

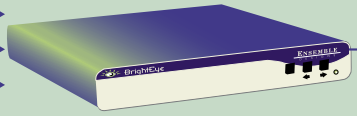
Optical



HD or SD SDI
AES

## BrightEye 75

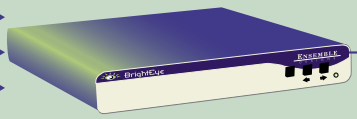
HD YPrPb, HD RGB
SD YPrPb, HD RGB
Composite, Y/C
Analog Audio
Ref



Embedded SDI

## BrightEye 76

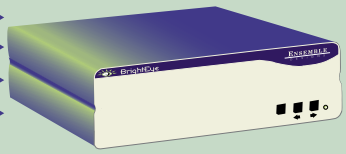
HD YPrPb, HD RGB
SD YPrPb, HD RGB
Composite, Y/C
Analog Audio
Ref



Optical

# BrightEye 90

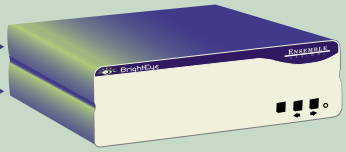
## Upconverter



Composite
SD SDI
AES (8 ch)
Ref

Embedded HD SDI
HDMI
Analog Audio Monitor

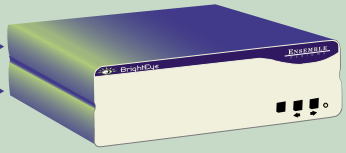
## Downconverter



Embedded HD SDI
Ref

SD SDI
Composite
HDMI
AES (8 ch)
Analog Audio Monitor

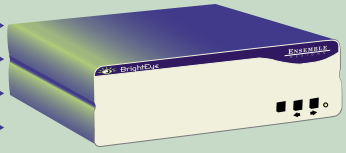
## Cross Converter



Embedded HD SDI
Ref

Embedded HD SDI
HDMI
AES (8 ch)
Analog Audio Monitor

## Aspect Ratio Converter



Composite
Embedded SD SDI
AES (8 ch)
Ref

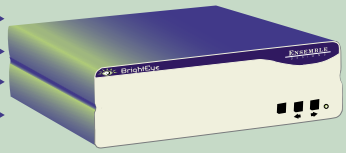
Embedded SD SDI
Composite
HDMI
AES
Analog Audio Monitor

8 channels of audio I/O selectable as 8 in or 8 out or 4 in and 4 out

# BrightEye 90-A

## Upconverter

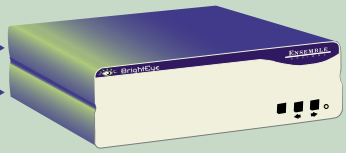
Composite
SD SDI
Analog Audio (8 ch)
Ref



Embedded HD SDI
HDMI
Analog Audio Monitor

## Downconverter

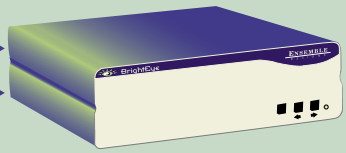
Embedded HD SDI
Ref



SD SDI
Composite
HDMI
Analog Audio (8 ch)
Analog Audio Monitor

## Cross Converter

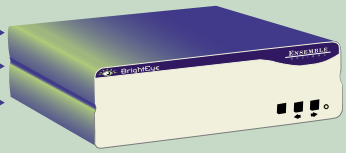
Embedded HD SDI
Ref



Embedded HD SDI
HDMI
Analog Audio (8 ch)
Analog Audio Monitor

## Aspect Ratio Converter

Analog Video
Embedded SD SDI
Ref

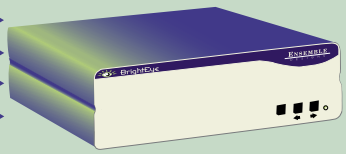


Embedded SD SDI
Composite
HDMI
Analog Audio Monitor

8 channels of audio I/O selectable as 8 in or 8 out or 4 in and 4 out

# BrightEye 90-F

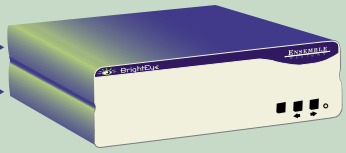
## Upconverter



Inputs: Composite, SD SDI, AES (8 ch), Ref

Outputs: Optical, Embedded HD SDI, HDMI, Analog Audio Monitor

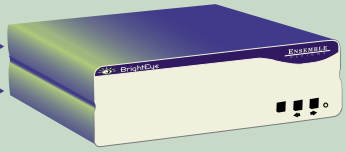
## Downconverter



Inputs: Embedded HD SDI, Ref

Outputs: Optical, SD SDI, Composite, HDMI, AES (8 ch), Analog Audio Monitor

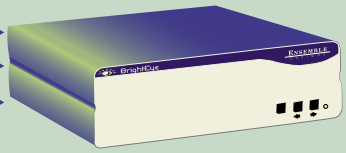
## Crossconverter



Inputs: Embedded HD SDI, Ref

Outputs: Optical, Embedded HD SDI, HDMI, AES (8 ch), Analog Audio Monitor

## Aspect Ratio Converter



Inputs: Composite, Embedded SD SDI, Ref

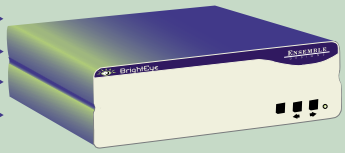
Outputs: Optical, Embedded SD SDI, Composite, HDMI, Analog Audio Monitor

8 channels of audio I/O selectable as 8 in or 8 out or 4 in and 4 out

# BrightEye 90-FA

## Upconverter

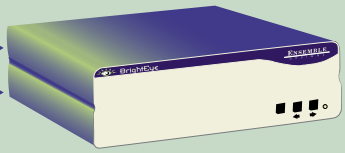
Composite
SD SDI
Analog Audio (8 ch)
Ref



Optical
Embedded HD SDI
HDMI
Analog Audio Monitor

## Downconverter

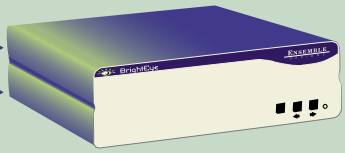
Embedded HD SDI
Ref



Optical
SD SDI
Composite
HDMI
Analog Audio (8 ch)
Analog Audio Monitor

## Crossconverter

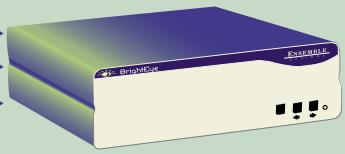
Embedded HD SDI
Ref



Optical
Embedded HD SDI
HDMI
Analog Audio (8 ch)
Analog Audio Monitor

## Aspect Ratio Converter

Composite
Embedded SD SDI
Ref



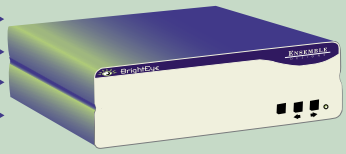
Optical
Embedded SD SDI
Composite
HDMI
Analog Audio Monitor

8 channels of audio I/O selectable as 8 in or 8 out or 4 in and 4 out

## BrightEye 91

**Upconverter**

Composite
SD SDI
AES (8 ch)
Ref

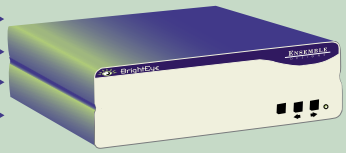


Embedded HD SDI
HDMI
Analog Audio Monitor

## BrightEye 91-A

**Upconverter**

Composite
SD SDI
Analog Audio (8 ch)
Ref

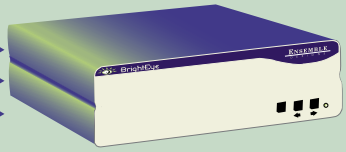


Embedded HD SDI
HDMI
Analog Audio Monitor

## BrightEye 92-A

**Downconverter**

Embedded HD SDI
AES (8 ch)
Ref



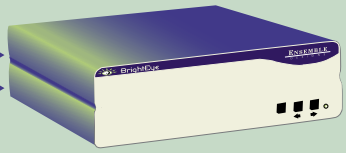
SD SDI
Composite
HDMI
Analog Audio Monitor

8 channels of audio I/O selectable as 8 in or 8 out or 4 in and 4 out

## BrightEye 92-M

**Downconverter**

Embedded HD SDI
Ref

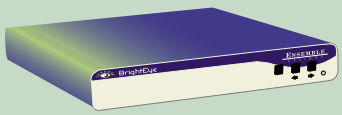


SD SDI
Composite
HDMI
Analog Audio Monitor

## BrightEye 92-MA

**Downconverter**

Embedded HD SDI

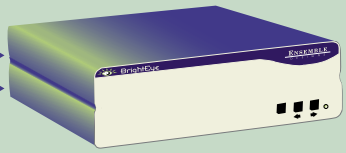


HD SDI
SD SDI
Composite
HDMI
Analog Audio

## BrightEye 93

**Crossconverter**

Embedded HD SDI
Ref

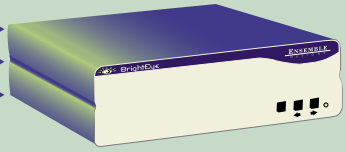


Embedded HD SDI
HDMI
Analog Audio Monitor

## BrightEye 94

**Aspect Ratio Converter**

Composite
Embedded SD SDI
Ref



Embedded SD SDI
Composite
HDMI
Analog Audio Monitor

# BrightEye Mitto

## 3G / HD / SD Scan Converter

**YouTube™ Video to Air Made Simple**
BrightEye™ Mitto is a high performance scan converter that supports SD, HD and 3G video signals.

For broadcasters who find they are relying on video content from the web, BrightEye Mitto offers the best way to take computer video to air. Video that once seemed constrained by your computer desktop can now be used for the most demanding broadcast and display applications.

**Exclusive Filtering and Scaling Technology**
A superior quality scan converter, BrightEye Mitto has the advantage of proprietary scaling technology and exclusive multi-tap filtering. The region selected for output determines if Mitto acts as an upconverter or downconverter. The filters automatically adjust in accordance with the conversion being performed.

Bringing progressive images from the desktop into the interlaced world of video used to be a compromise between sharp details versus interfield flicker. Mitto's advanced filtering satisfies both of these seemingly contradictory requirements. The result is that the output looks as good, or better, than the original and passes the most stringent testing.

**Digital and Analog Video and Audio**
The intuitive front panel interface makes it easy to choose the desired video output format. Choices are 1.5 and 3 Gb/s HD SDI and SD SDI. Composite video is simultaneously output on a separate BNC. The genlock reference input allows the video outputs to be timed to house.

The audio input accepts either AES digital audio or analog audio. Audio is embedded into the SDI outputs which is required for many high-end applications.

**Amazingly Simple and Effective User Interface**
The included Mac/PC application let's you simply use your mouse to click and drag over the specific portion of computer video that you want to output. The beauty of this user interface is that you can see which parts of the screen you don't want to output, as well as the parts you do want to use. The perspective of seeing the whole screen gives you the ability to choose exactly which portion of the video you want to output. And it's easy to use. Whether you output the entire screen of just a selected portion, you'll be able to see exactly what you are doing. Plus, presets enable you to store your favorite settings.

**Free Software Upgrades Forever**
BrightEye Mitto's software is easily upgraded through the unit's USB port. Software upgrades are available for no charge for the life of the product and are conveniently downloadable from the Ensemble Designs web site. Every unit comes with a five-year warranty.

- High performance scan converter
- Outputs 1.5 and 3 Gb/s HD, SD SDI and composite video
- DVI and VGA I/O, HDMI support with an adaptor
- Analog audio and AES digital audio input
- Easy-to-use Mac and PC user interface
- Use a mouse to select what part of the video you want to output
- Intuitive front panel controls
- Easily adjust video parameters and select video output format
- Genlock and time to house reference
- Proprietary scaling and multi-tap filtering system
- Rackmountable
- Memory presets for your favorite settings
- 5-year warranty and free software upgrades

## Specifications

### Computer Input

| | |
|---|---|
| Number | One |
| Type | DVI or VGA (Supports HDMI with adaptor) |
| Connector | DVI-I |
| Resolution | Up to 1920 x 1200 |

### Reference Input

| | |
|---|---|
| Number | One, BNC |
| Type | 1 V P-P Composite Video PAL, NTSC, Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Analog Audio Inputs

| | |
|---|---|
| Number | One stereo pair |
| Connector | 1/8" mini jack |
| Impedance | >15K Ω |
| Max Input Level | 24 dBu |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### AES/EBU Digital Inputs

| | |
|---|---|
| Number | Two (four channels) |
| Type | AES3id, S/PDIF |
| Connector | 1/8" mini jack |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 192 KHz (Sample Rate Converted Internally to 48KHz) |

### Serial Digital Output

| | |
|---|---|
| Number | Two, BNC |
| Signal Type | 1.485 Gb/s HD, 2.97 Gb/s HD or 270 Mb/s SD SDI |
| Audio | Embedded |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Output DC | None (AC coupled) |

SDI Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz
- 3 Gb/s Level A or Level B (SMPTE 424M, 425M)
- 525i, 625i (SMPTE 259M)

### Analog Video Output

| | |
|---|---|
| Number | One, BNC |
| Type | Composite PAL or NTSC |
| Return Loss | >40 dB |
| Output DC | <100 mV |

### Computer Monitor Output

| | |
|---|---|
| Number | One, looping |
| Type | DVI or VGA (Supports HDMI with adaptor) |
| Connector | DVI-I |
| Format | Follows input |

### RS-232 Control

| | |
|---|---|
| Number | One |
| Connector | 9 pin D |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.6" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 12 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

## Sample Application

**Mitto** Defined:
- comes from the Latin root for ***transmit*** or ***send***
- it's also the root word of ***uncompromising***

# BrightEye 1

## Analog / SD SDI to SD SDI / Optical Converter with TBC and Frame Sync

BrightEye 1 is a comprehensive solution to signal acquisition. With analog component, analog composite S-Video (Y/C), and SDI video inputs, it can take on any video source. The built-in Time Base Corrector/Frame Synchronizer provides a rock steady output — even with marginal inputs. The reference input is used to genlock the converter output to house reference such as color black.

Front panel controls select input source, format and adjust video gain. Video levels can be adjusted through BrightEye Mac or PC software.

Simultaneous SD SDI (electrical) and Optical outputs are provided, so you can deliver the signal just about anywhere. Both Color Bars and the SD SDI Checkfield (Pathological) test patterns are included to facilitate transmission path testing.

- Use with Cameras, Satellite Receivers and VHS Decks
- Analog and SD SDI Input
- SD SDI and Optical Output
- TBC and Frame Sync
- 12 Bit

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |
| Automatic Input Cable Equalization | |

### Analog Input

| | |
|---|---|
| Number | One |
| Type | Beta/SMPTE, Y, Pr, Pb<br>NTSC, PAL Composite<br>NTSC, PAL S-Video |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### Optical Output

| | |
|---|---|
| Number | One |
| Type | 270 Mb/s SD Serial Digital (SMPTE 259M)<br>(Optical equivalent of 259M) |
| Wavelength | 1310 nm (1550 by special order) |
| Power | –7 dBm |
| Maximum length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | SC |

### Analog to SDI Performance

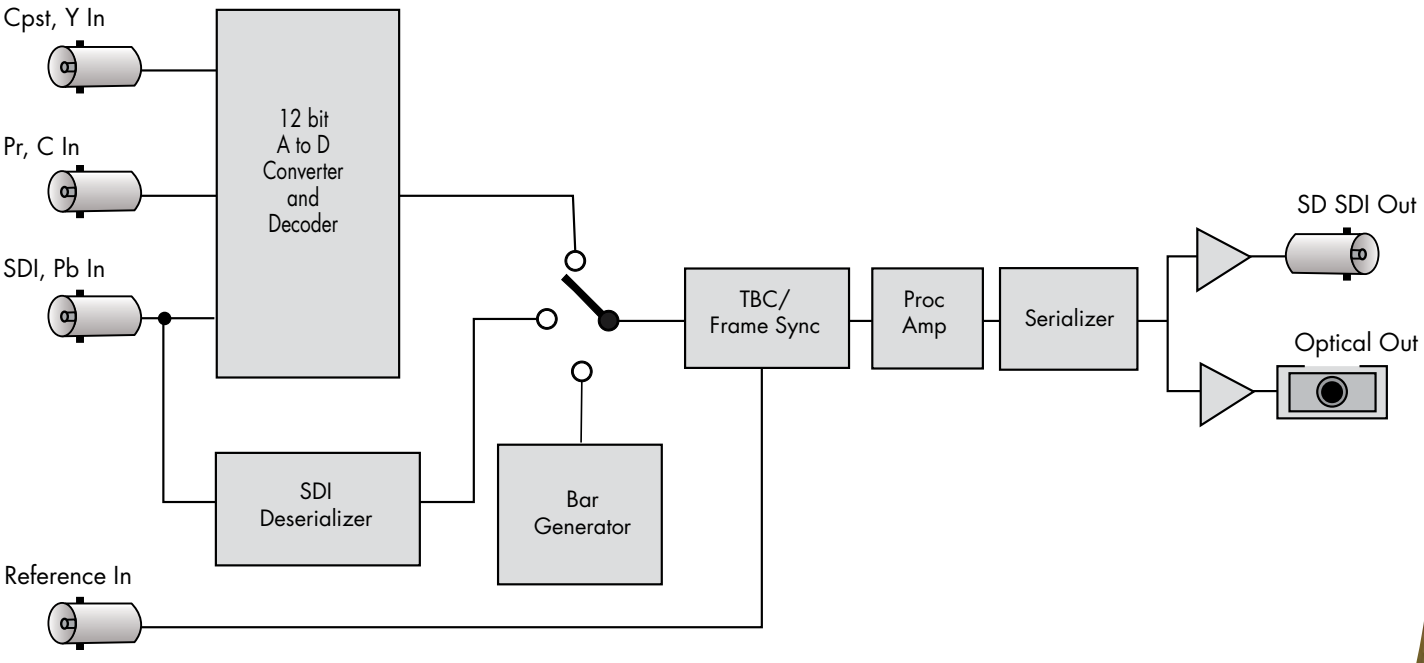
| | |
|---|---|
| Bit Resolution | 12 bit input quantization<br>4 X oversampling |
| Signal to Noise | >62 dB, weighted |
| Frequency Response | |
| Composite and Y | ±0.1 dB, 0 to 5.5 MHz |
| Pr, Pb | ±0.1 dB, 0 to 2.75 MHz |
| Minimum Delay | 90 µSec |

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video, PAL or NTSC |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 7 watts<br>(100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 2

## Analog to SD SDI Converter

BrightEye 2 provides uncompromised analog to digital video conversion of component and composite video. Analog inputs are digitized at 12 bits of resolution with 4x oversampling. Composite video is processed through an adaptive comb filter decoder. PAL / NTSC input detection is automatic.

Input selection and gain adjustment is made from the front panel. A status display provides an input presence indication. Video levels can be adjusted through BrightEye Mac or PC software.

Supporting both Beta and SMPTE component, composite, and Y/C formats, BrightEye 2 adapts to many conversion needs.

Use BrightEye 2 to digitize analog VTRs and cameras.

- Use with VTRs and Cameras
- Composite and S-Video Input
- Component Input
- SD SDI Output
- 12 Bit

## Specifications

### Analog Input

| | |
|---|---|
| Number | One |
| Type | Beta/SMPTE, Y, Pr, Pb<br>NTSC, PAL Composite<br>NTSC, PAL S-Video |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Serial Digital Output

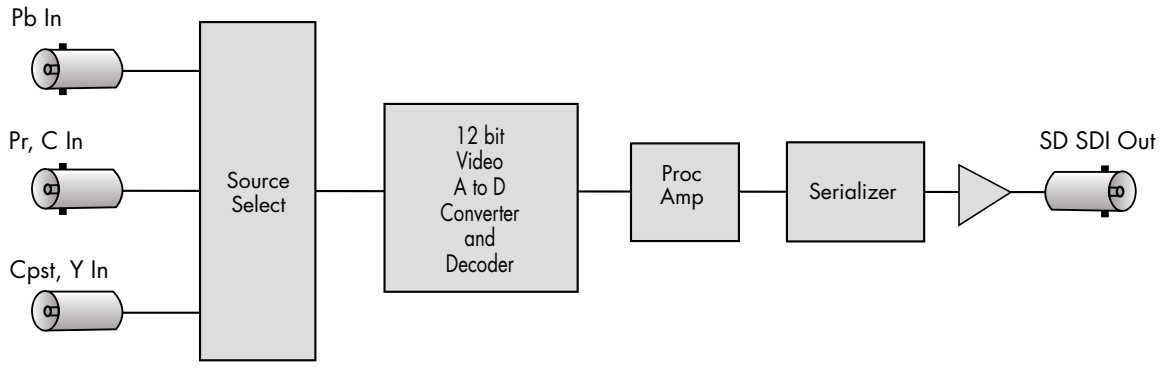
| | |
|---|---|
| Number | One |
| Type | 270 Mb/s SD Serial Digital<br>(SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### Analog to SDI Performance

| | |
|---|---|
| Bit Resolution | 12 bit input quantization<br>4 x oversampling |
| Signal to Noise | >62 dB, weighted |
| Frequency Response | |
| Composite and Y | ±0.1 dB, 0 to 5.5 MHz |
| Pr, Pb | ±0.1 dB, 0 to 2.75 MHz |
| Minimum Delay | 90 µSec |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D<br>(143 mm x 20 mm x 140 mm)<br>including connectors |
| Power | 12 volts, 5 watts<br>(100-230 VAC modular power supply<br>not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 3

## Analog to SD SDI Converter with TBC and Frame Sync

BrightEye 3 is an agile Time Base Corrector / Frame Synchronizer with composite, component and Y/C inputs and SD SDI video out. Input signals are digitized to 12 bits of resolution and time base corrected by a noise tolerant tracking circuit. An external reference input allows genlock to a timing reference such as color black.

Input selection, gain control, and TBC enable is provided through the front panel interface. Video levels can be adjusted through BrightEye Mac or PC software.

Input and Reference presence are indicated through front panel LEDs. BrightEye 3 is great for capturing consumer VCRs into non-linear editing systems.

- Use with Cameras, Satellite Receivers and VHS Decks
- Analog Input
- SD SDI Output
- TBC and Frame Sync
- 12 Bit

## Specifications

### Analog Input

| | |
|---|---|
| Number | One |
| Type | Beta/SMPTE, Y, Pr, Pb<br>NTSC, PAL Composite<br>NTSC, PAL S-Video |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Type | 270 Mb/s SD Serial Digital<br>(SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### Analog to SDI Performance

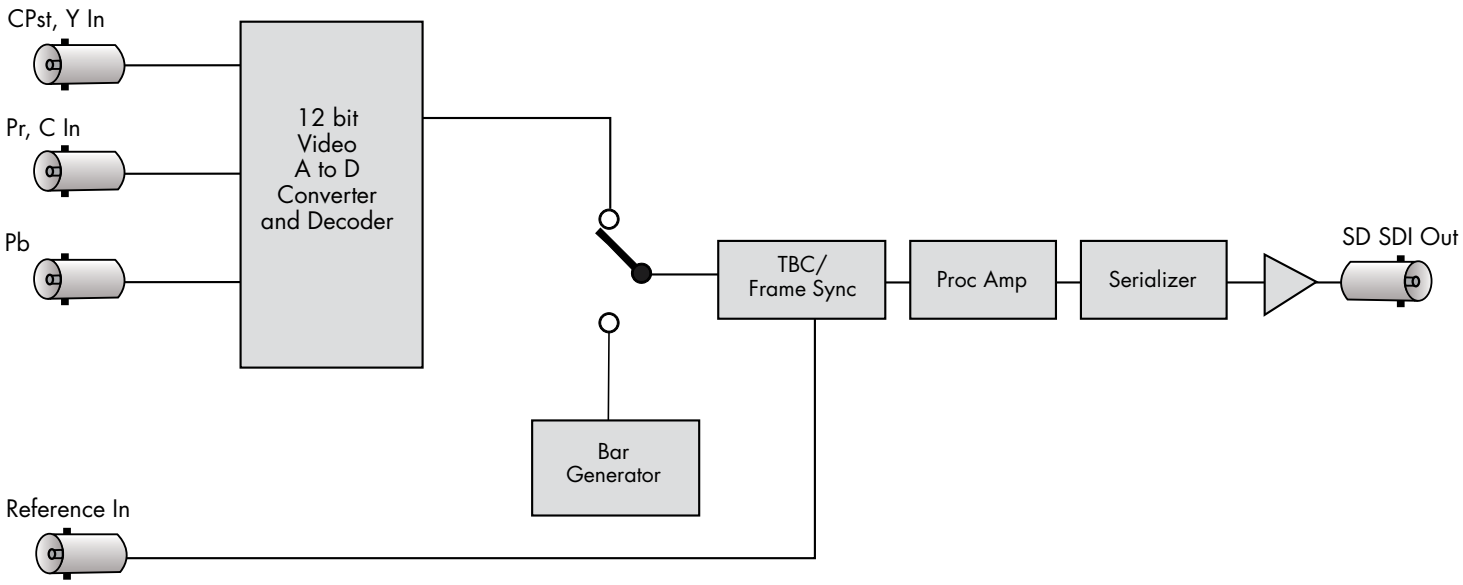
| | |
|---|---|
| Bit Resolution | 12 bit input quantization<br>4 x oversampling |
| Signal to Noise | >62 dB, weighted |
| Frequency Response | |
| Composite and Y | ±0.1 dB, 0 to 5.5 MHz |
| Pr, Pb | ±0.1 dB, 0 to 2.75 MHz |
| Minimum Delay | 90 µSec |

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video,<br>PAL or NTSC |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D<br>(143 mm x 20 mm x 140 mm)<br>including connectors |
| Power | 12 volts, 5 watts<br>(100-230 VAC modular power<br>supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



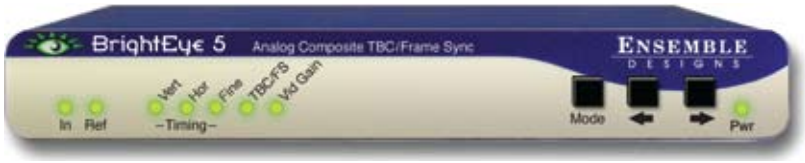
# BrightEye 5

## Analog Composite TBC and Frame Sync

BrightEye 5 is a Time Base Corrector with analog composite inputs and outputs. 12 bit digital signal processing ensures the best signal handling and a solid output. BrightEye 5 will time base correct signals from analog sources such as consumer VCRs, cameras and noisy microwave receivers.

The analog input is converted at 12 bits of resolution for digital processing. The signal is time base corrected and frame synchronized to the reference input and converted back to analog for output. BrightEye 5 auto detects the video standard of the input (PAL or NTSC).

Basic controls are provided on the front panel. With BrightEye Mac or PC software, you can control video proc functions; Gain, Chroma, Pedestal, and Hue. The vertical interval can be passed or blanked.



- Use with VCR's, cameras, satellite receivers
- Analog Video Inputs and Outputs
- TBC and Frame Sync
- 12 bit processing

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | NTSC, PAL Composite |
| Impedance | 75 Ω |
| Return Loss | >40 dB, DC to 5.5Mhz |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video, PAL or NTSC |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Performance

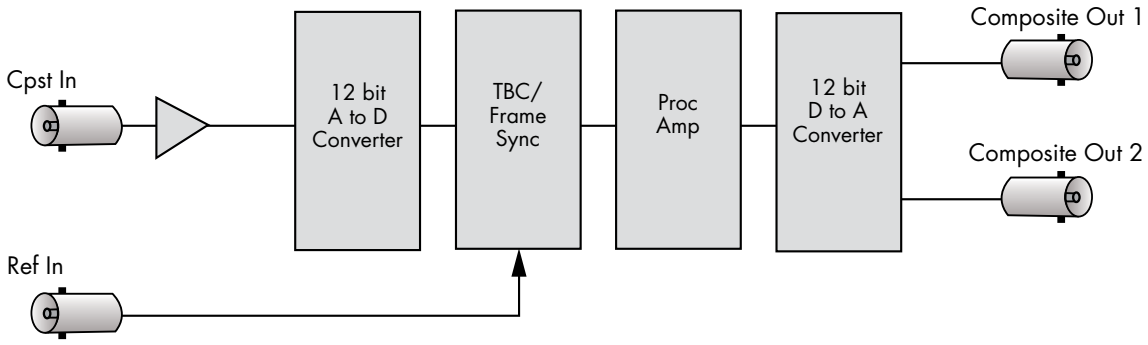
| | |
|---|---|
| Frequency Response | ±0.1 dB , 0 to 5.5 MHz |
| K Factor | <1% |
| ScH Phase Error | <±2° |
| Differential Phase | <1° |
| Differential Gain | <1% |
| Signal to Noise | >65 dB |
| Timing Window | Infinite (with respect to reference) |
| Output ScH | Phase matches reference |
| Timing Resolution | Adjustable to within 1° of subcarrier |

### Analog Video Output

| | |
|---|---|
| Number | Two |
| Type | Composite PAL or NTSC (follows input) |
| Return Loss | >40 dB |
| Output DC | <100 mV |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 4 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |



# BrightEye 10

## Optical / SD SDI to Analog / SDI Converter

BrightEye 10 is a digital to analog video converter with both SD SDI (electrical) and fiber optic inputs. Output formats include Beta and SMPTE component, RGB, and composite (with simultaneous Y/C). Video processing, encoding and analog conversion is performed digitally at 12 bits of resolution with 8 x oversampling.

Front panel controls select between the optical and SDI input, choose the analog output format, and adjust gain. Video levels can be adjusted through BrightEye Mac or PC software.

The reclocked SD SDI output follows the input selector, thus providing optical to electrical conversion when the optical input is selected. BrightEye 10 combines fiber to SD SDI conversion and QC monitoring in one compact unit.

- Use with VCR's, cameras, satellite receivers
- Analog Video Inputs and Outputs
- TBC and Frame Sync
- 12 bit processing

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |

Automatic Input Cable Equalization

### Optical Input

| | |
|---|---|
| Number | One |
| Type | SD (SMPTE 297M, optical equivalent of 259M) |
| Wavelength | 1310 nm |
| Receiver sensitivity | –18 dBm |
| Maximum length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | SC |

### Analog Output

| | |
|---|---|
| Number | One |
| Type | Beta/SMPTE, Y, Pr, Pb<br>RGB<br>NTSC, PAL Composite<br>NTSC, PAL S-Video |
| Return Loss | >40 dB |
| Output DC | None (AC coupled) |

### Serial Digital Output

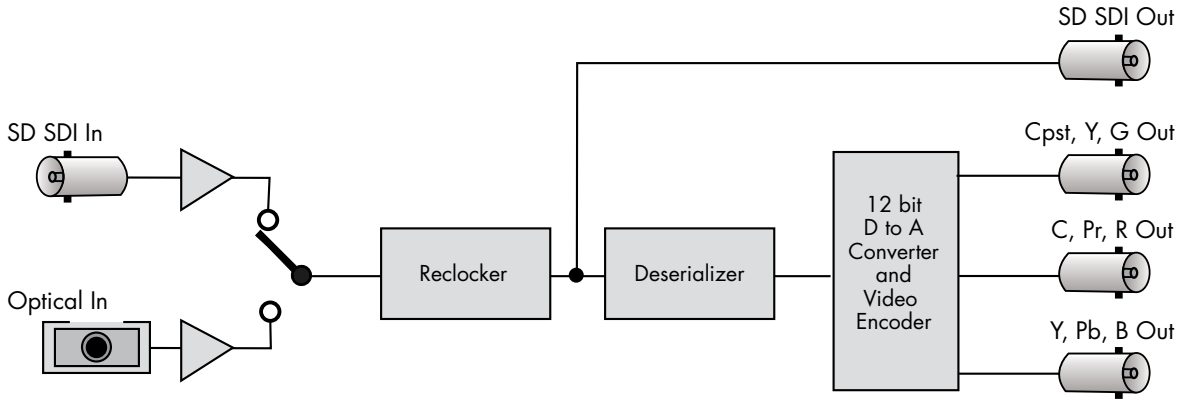
| | |
|---|---|
| Number | One |
| Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | <50 mV |

### SDI to Analog Performance

| | |
|---|---|
| Bit Resolution | 12 bit output reconstruction<br>8 x oversampling |
| Signal to Noise | >65 dB |
| Frequency Response | ±0.1 dB, 0 to 5.5 MHz |
| K Factor | <1% |
| ScH Phase Error | <±2 degrees |
| Differential Phase | <1 degree |
| Differential Gain | <1% |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 4 watts<br>(100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 11

## SD SDI to Analog Converter

BrightEye 11 provides digital to analog video conversion with the full range of analog output formats available: Beta, SMPTE, RGB, and Composite (with simultaneous Y/C).

12 bit processing and conversion at 8 x oversampling mean the best looking images possible.

Output format and gain are controlled from the front panel. A status display indicates input presence. Video levels can be adjusted through BrightEye Mac or PC software.

BrightEye 11 is the perfect choice to feed monitors, VTRs, or video projectors.

- Use with Monitors, VTRs and Projectors
- SD SDI Input
- Analog Composite Output
- Component, S-Video Output
- 12 Bit

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |
| Automatic Input Cable Equalization | |

### Analog Output

| | |
|---|---|
| Number | One component or one composite and one Y/C |
| Type | Beta/SMPTE, Y, Pr, Pb<br>RGB<br>NTSC, PAL Composite<br>NTSC, PAL S-Video |
| Return Loss | >40 dB |
| Output DC | None (AC coupled) |

### Serial Digital Output

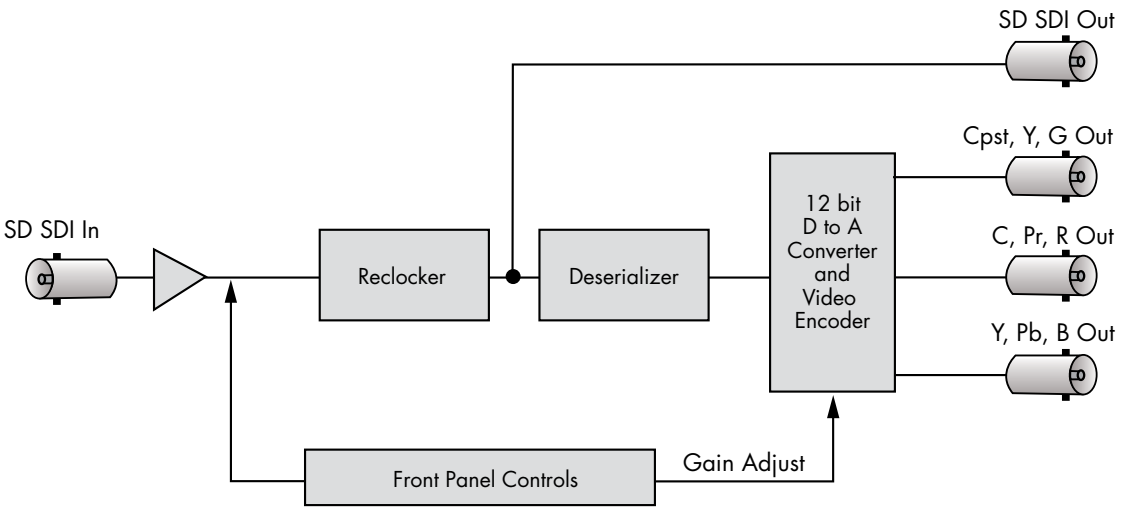
| | |
|---|---|
| Type | SMPTE 259M |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | <50 mV |

### SDI to Analog Performance

| | |
|---|---|
| Bit Resolution | 12 bit output reconstruction<br>8 x oversampling |
| Signal to Noise | >65 dB |
| Frequency Response | ±0.1 dB, 0 to 5.5 MHz |
| K Factor | <1% |
| ScH Phase Error | <±2 degrees |
| Differential Phase | <1 degree |
| Differential Gain | <1% |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 4 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



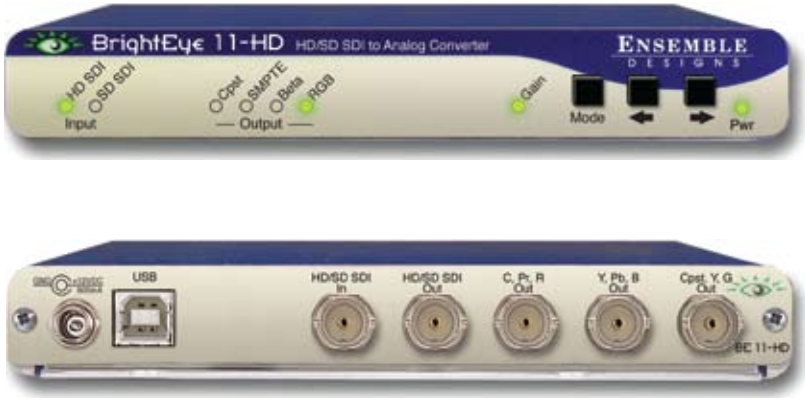
# BrightEye 11-HD

## HD / SD SDI to Analog Converter

BrightEye 11-HD provides HD or SD digital to analog video conversion with the full range of analog output formats available for HD and SD. When an HD input is present HD RGB or YPrPb are output. When an SD input is present Beta, SMPTE, RGB or composite with simultaneous Y/C is output.

12 bit processing and conversion at 8 x oversampling mean the best looking images possible.

Output format and gain are controlled from the front panel. A status display indicates input presence. Video levels can be adjusted through BrightEye Mac or PC software.




- Use with HD or SD Monitors, VTRs and Projectors
- SD SDI Input
- Analog Composite Output
- Component, S-Video Output
- 12 Bit

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Type | HD Serial Digital 1.485 Gb/s<br>SMPTE 274M, 292M or 296M<br>or SD Serial Digital<br>270 Mb/s SMPTE 259M-C |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD<br>300 meters for SD<br>(Belden 1694A) |

Automatic Input Cable Equalization

HD Standards Supported:
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Analog Output

HD input yields HD analog out,
SD input yields SD analog out

| | |
|---|---|
| Number | One component or<br>one composite and one Y/C |
| Type | Beta/SMPTE, Y, Pr, Pb<br>RGB<br>NTSC, PAL Composite<br>NTSC, PAL S-Video |
| Return Loss | >40 dB |
| Output DC | None (AC coupled) |

### Serial Digital Output

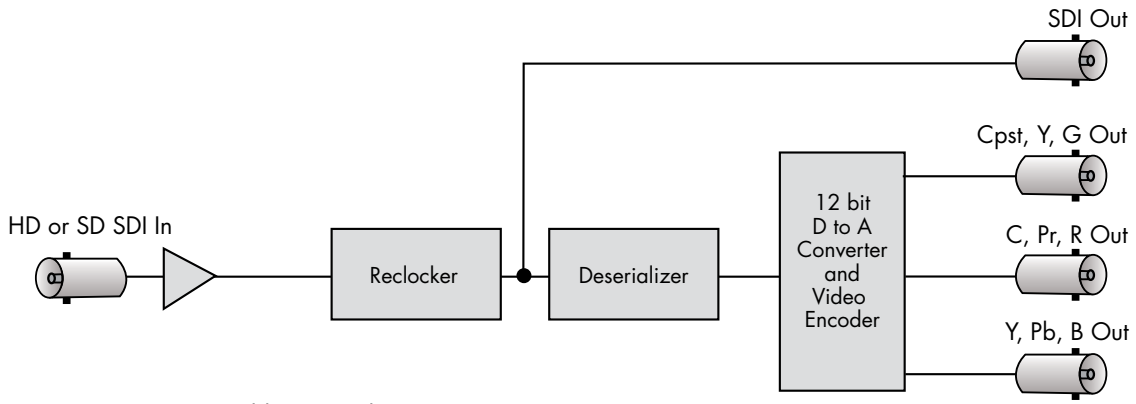
| | |
|---|---|
| Number | One |
| Type | Follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD<br>300 meters for SD<br>(Belden 1694A) |

### SDI to Analog Performance

| | |
|---|---|
| Bit Resolution | 12 bit output reconstruction<br>8 x oversampling |
| Signal to Noise | >65 dB |
| Frequency Response | ±0.1 dB, 0 to 5.5 MHz |
| K Factor | <1% |
| ScH Phase Error | <±2 degrees |
| Differential Phase | <1 degree |
| Differential Gain | <1% |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D<br>(143 mm x 20 mm x 140 mm)<br>including connectors |
| Power | 12 volts, 7 watts<br>(100-230 VAC modular power<br>supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |




HD SDI In Yields HD Analog Out
SD SDI In Yields SD Analog Out

# BrightEye 15

## SD SDI to Analog Converter with Frame Sync / Genlock

BrightEye 15 is a digital to analog video converter with a timeable output. It's perfect for feeding analog switchers and routers, where signal timing is required.

BrightEye 15 has an SD SDI video input and a reference input. The input signal is converted to analog composite and synchronized (genlocked) to the reference signal. The analog composite output is fully timed with respect to the reference, including ScH phase.

Basic controls are provided on the front panel. With BrightEye Mac or PC software, you can control video proc functions; Gain, Chroma, Pedestal, and Hue. The vertical interval can be passed or blanked.

- Feed Analog Switchers and Routers
- SD SDI Input
- Analog Video Output
- Timing Control for Output

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15dB |
| Max Cable Length | 300 meters |

Automatic Input Cable Equalization

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video, PAL or NTSC |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Analog Video Output

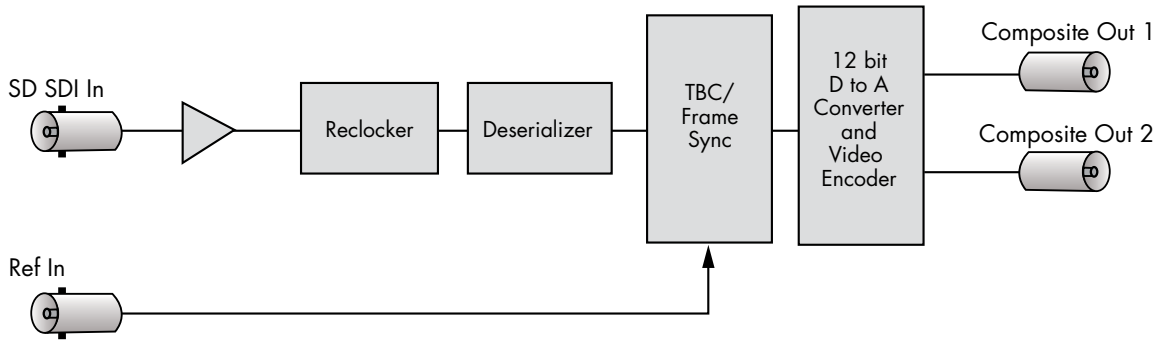
| | |
|---|---|
| Number | Two |
| Type | Composite PAL or NTSC (follows input) |
| Return Loss | >40 dB |
| Output | DC < 100 mV |

### SDI to Analog Performance

| | |
|---|---|
| Bit Resolution | 12 bit output reconstruction 8 x oversampling |
| Signal to Noise | >65 dB |
| Timing Window | Infinite (with respect to reference) |
| Output | ScH Phase matches reference |
| Timing Resolution | Adjustable to within 1 degree of subcarrier |
| Frequency Response | ±0.1 dB, 0 to 5.5 MHz |
| K Factor | <1% |
| ScH Phase Error | <±2 degrees |
| Differential Phase | <1 degree |
| Differential Gain | <1% |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 3 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |



# BrightEye 16

## SD SDI to Analog Video Converter with Frame Sync / Genlock and Audio Disembedder

BrightEye 16 is a digital to analog video converter with a timeable output. It's perfect for feeding analog switchers and routers, where signal timing is required. It's also a disembedder and provides four analog audio outputs.

With timing controls, proc adjustments, and a built-in audio mixer, BrightEye 16 provides a complete solution for digital to analog conversion.

BrightEye 16 has an SDI video input and a reference input. The input signal is converted to analog composite and synchronized (genlocked) to the reference signal. The analog composite output is fully timed with respect to the reference, including ScH phase. Audio is disembedded with 24 bit precision and converted to analog.

Basic controls are accessed on the front panel. BrightEye Mac or PC software provides access to video proc functions and the built-in audio mixer. The vertical interval can be passed or blanked. VU indication is provided on the front panel and through BrightEye Mac or PC software.

- Feed Analog Switchers and Routers
- SD SDI Input
- Analog Video Output
- Timing Control for Output
- Audio Disembedding
- Analog Audio Outputs

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15dB |
| Max Cable Length | 300 meters |
| Automatic Input Cable Equalization | |

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video, PAL or NTSC |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Analog Video Output

| | |
|---|---|
| Number | Two |
| Type | Composite PAL or NTSC (follows input) |
| Return Loss | >40 dB |
| Output | DC < 100 mV |

### SDI to Analog Performance

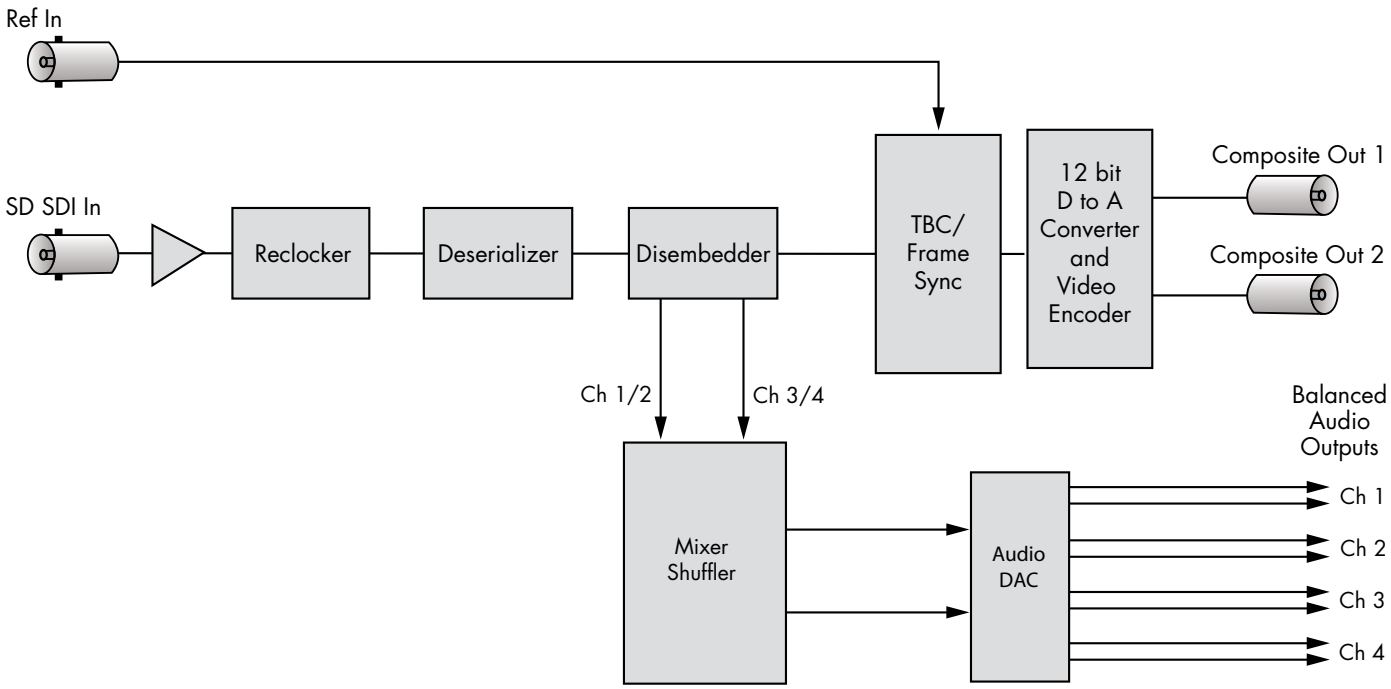
| | |
|---|---|
| Bit Resolution | 12 bit output reconstruction<br>8 x oversampling |
| Signal to Noise | >65 dB |
| Timing Window | Infinite (with respect to Reference) |
| Output | ScH Phase matches Reference |
| Timing Resolution | Adjustable to within 1 degree of subcarrier |
| Frequency Response | ±0.1 dB, 0 to 5.5 MHz |
| K Factor | <1% |
| ScH Phase Error | <±2 degrees |
| Differential Phase | <1 degree |
| Differential Gain | <1% |

### Analog Audio Outputs

| | |
|---|---|
| Number | Four |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Max Output Level | 24 dBu |
| Resolution | 24 bits, 128 x oversampled |
| Reference Level | -10 dBu to +4 dBu |
| Frequency Response | ± 0.1dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 5 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |



# BrightEye 20

## Analog Audio / AES Embedder or Disembedder

BrightEye 20 is a versatile audio Mux/Demux. With SDI video I/O, and both analog and AES I/O, it is field configurable for embedding or disembedding.

When configured as a multiplexer, BrightEye 20 has one serial digital video input and two AES digital audio inputs. Alternately, the 4 channel analog audio input can be used. The audio is embedded into the 601 video stream. The output is a serial digital video stream that contains the original video plus the two AES streams or four analog audio channels.

When configured as a demultiplexer, audio signals present in the incoming serial digital video signal are extracted and delivered simultaneously as two AES digital audio streams and as four analog audio channels.

Audio mixing, level adjustments, and channel shuffling can be applied to both the multiplexer and demultiplexer modes, and are accessed through BrightEye Mac or PC software. Audio group selection is also made through BrightEye Mac or PC software. A variety of audio connectors and adapters are available for integrating BrightEye 20 to any type of system.

- Audio Embedder or Disembedder
- Analog and Digital Inputs
- Analog and Digital Outputs
- Use in Desktop and Broadcast Applications

## Specifications

### Video Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |
| Automatic Input Cable Equalization | |

### Video Output

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### Analog Audio Inputs

| | |
|---|---|
| Number | Four (selectable as inputs or outputs) |
| Type | Balanced |
| Impedance | >15K Ω |
| Maximum Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### AES/EBU Digital Inputs

| | |
|---|---|
| Number | Two (total of four channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 96 KHz (Sample Rate Converted internally to 48 KHz) |
| Reference Level | -18 or -20 dBFS (selectable) |
| AC-3, Dolby-E | Supported when inputs are synchronous |

### Analog Audio Outputs

| | |
|---|---|
| Number | Four (selectable as inputs or outputs) |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |
| Resolution | 24 bits, 128 x oversampled |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ± 0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### AES/EBU Digital Outputs

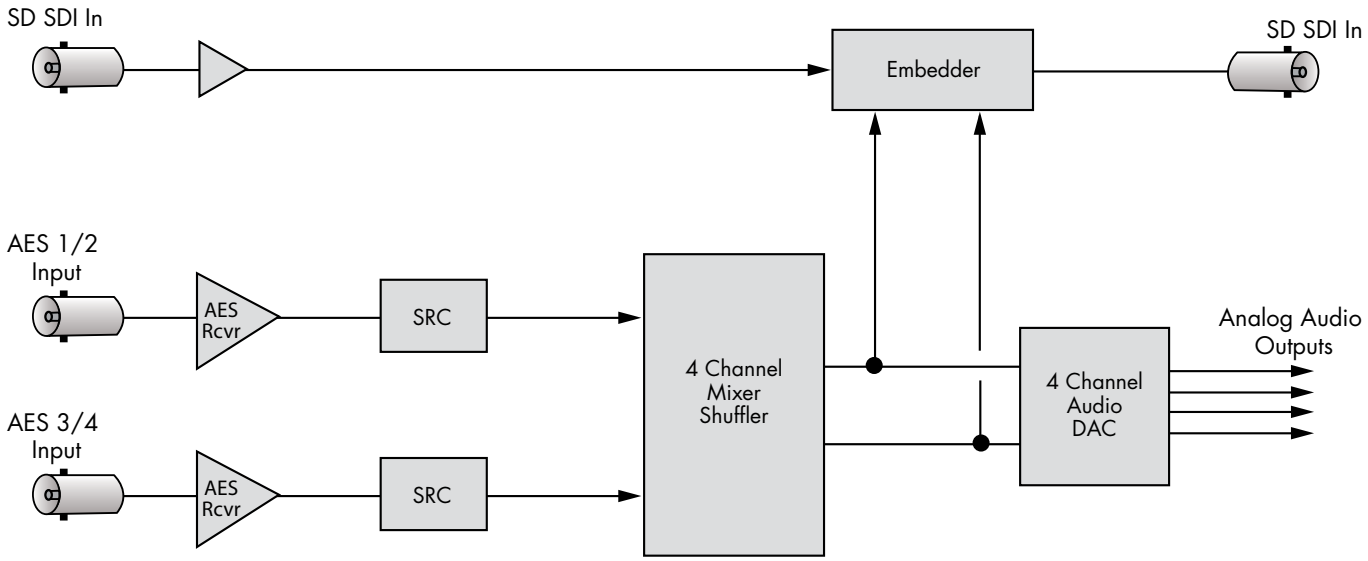
| | |
|---|---|
| Number | Two (total of four channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 24 Bit |
| Sample Rate | 48 KHz Synchronous to video output |
| Reference Level | -18 or -20 dBFS (selectable) |

### General Specifications

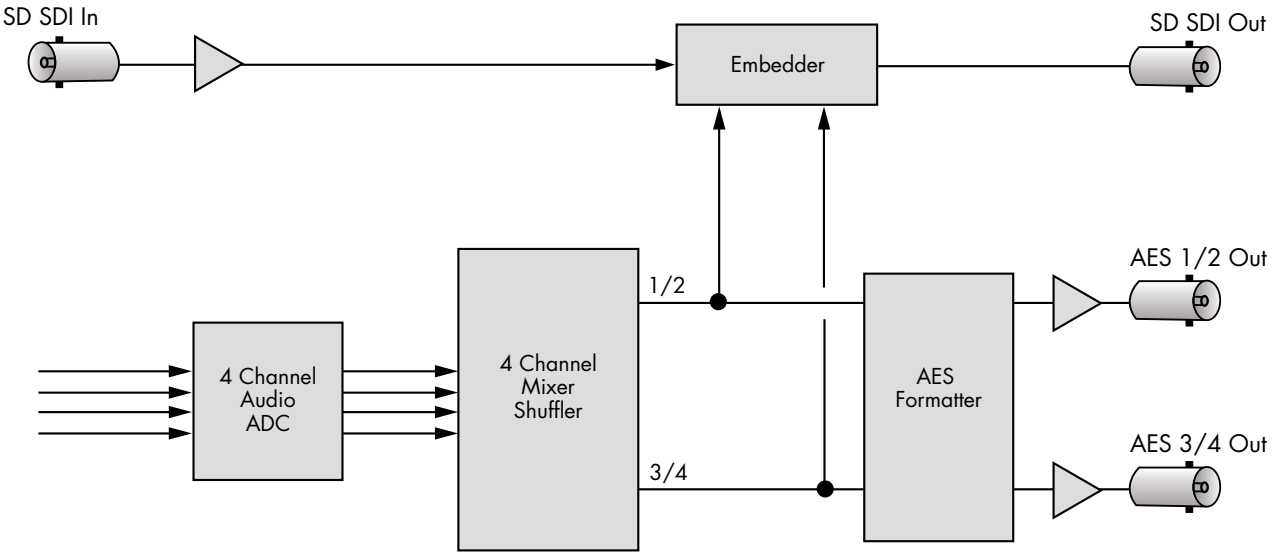
| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 7 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |

BrightEye 20 Block Diagrams on following pages

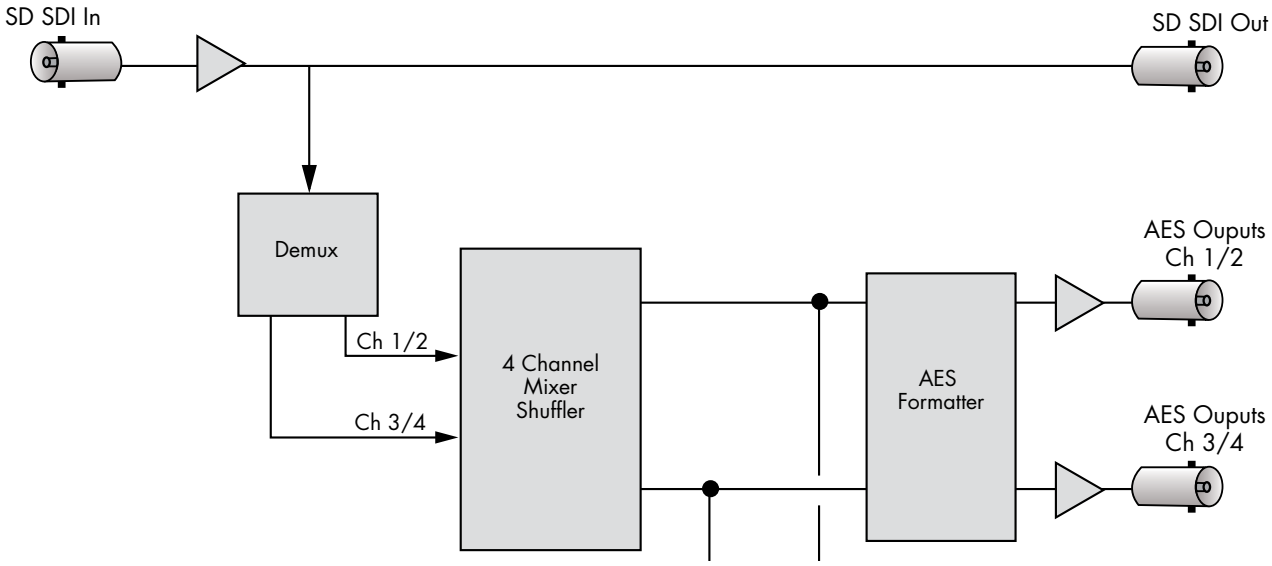
## AES Mux (Cascade or Replace) Mode




## Analog Mux (Cascade or Replace) Mode



## Demux Mode


SD SDI In
SD SDI Out
Demux
Ch 1/2
Ch 3/4
4 Channel
Mixer
Shuffler
AES
Formatter
AES Ouputs
Ch 1/2
AES Ouputs
Ch 3/4

# BrightEye 21

## AES / SD SDI Embedder

BrightEye 21 is an embedder, or multiplexer, with one serial digital video input and two AES digital audio inputs. The two AES audio streams are embedded into the digital video stream. The output is a serial digital video stream that contains the original video plus the two AES pairs.

Audio mixing, level adjustments, and channel shuffling are accessed through BrightEye Mac or PC software. Audio group selection is also made through BrightEye Mac or PC software. Use BrightEye 21 in desktop and broadcast applications.

- Use with Desktop and Broadcast Applications
- Use with Servers, Workstations and Routers
- Audio Embedder
- SD SDI and AES Inputs
- Embedded SDI Output

## Specifications

### Video Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital SMPTE 259M |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |
| Automatic Input Cable Equalization | |

### Video Output

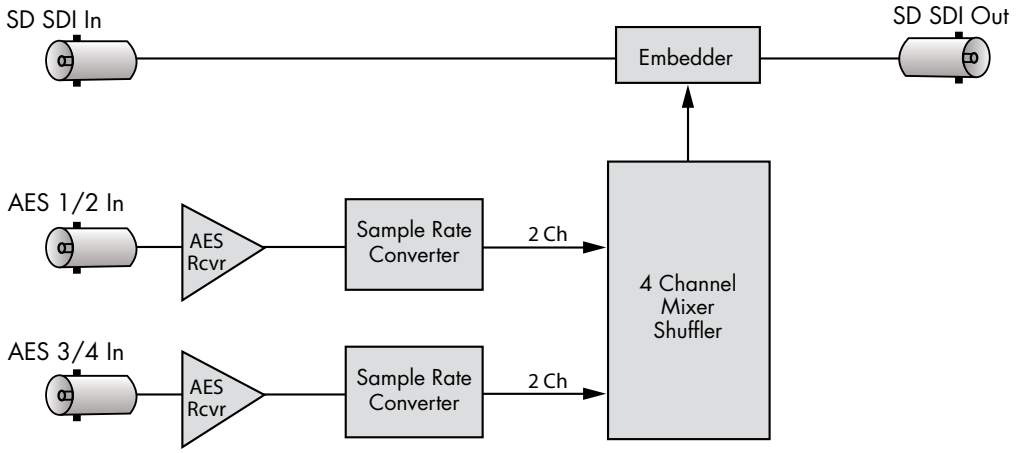
| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital SMPTE 259M |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### AES/EBU Digital Inputs

| | |
|---|---|
| Number | Two (total of four channels) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 96 KHz (Sample Rate Converted internally to 48 KHz) |
| Reference Level | -18 or -20 dBFS (selectable) |
| AC-3, Dolby-E | Supported when inputs are synchronous |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 3 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 22

## SD SDI / AES Disembedder

BrightEye 22 is a disembedder, or demultiplexer, for use in desktop and broadcast applications. Audio signals present in the incoming serial digital video signal are extracted and delivered as two AES digital audio streams.

Audio mixing, level adjustments, and channel shuffling are accessed through BrightEye Mac or PC software. Audio group selection is also made through BrightEye Mac or PC software.

- Use with Servers and Satellite Receivers
- Audio Disembedder
- Embedded SDI Input
- SD SDI and AES Outputs

## Specifications

### Video Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital SMPTE 259M |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |
| Automatic Input Cable Equalization | |

### Video Output

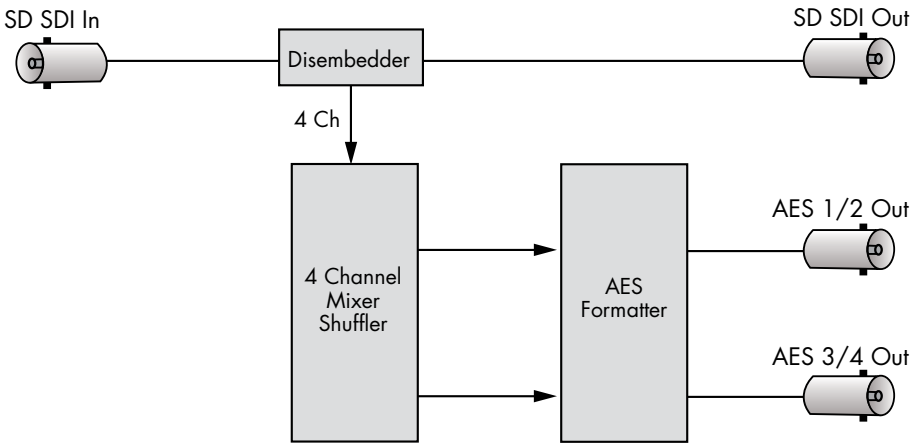
| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital SMPTE 259M |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### AES/EBU Digital Outputs

| | |
|---|---|
| Number | Two (total of four channels) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 24 Bit |
| Sample Rate | 48 KHz<br>Synchronous to Video output |
| Reference Level | -18 or -20 dBFS (selectable) |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 3 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 23

## Analog Audio / SD SDI Embedder

BrightEye 23 is an embedder, or multiplexer with one serial digital video input and a four channel analog audio input. The four analog audio channels are digitized and then embedded into the 601 video stream. The output is a serial digital video stream that contains the original video plus the four analog audio channels.

Audio mixing, level adjustments, and channel shuffling are accessed through BrightEye Mac or PC software. Audio group selection is also made through BrightEye Mac or PC software. A variety of audio connectors and adapters are available for integrating BrightEye 23 to any type of system.

- Use with VTRs, Workstations and Satellite Receivers
- Audio Embedder
- SD SDI and Analog Audio Inputs
- Embedded SDI Output

## Specifications

### Video Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital SMPTE 259M |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |
| Automatic Input Cable Equalization | |

### Video Output

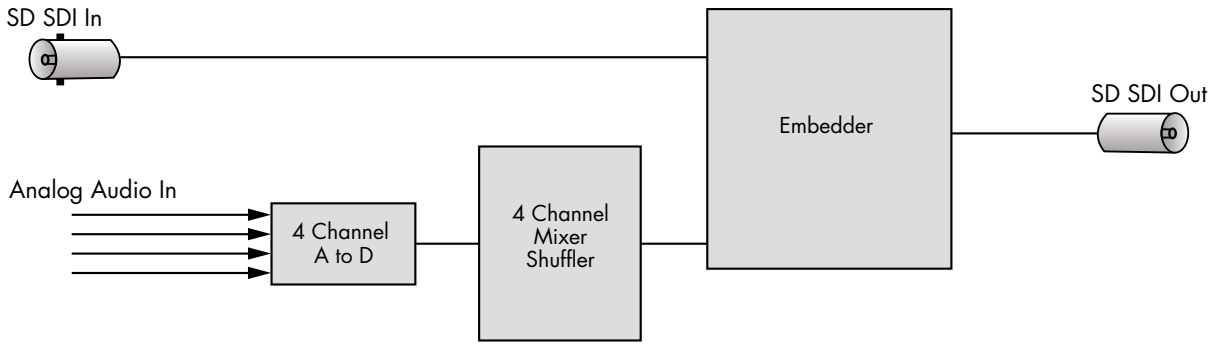
| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital SMPTE 259M |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### Analog Audio Inputs

| | |
|---|---|
| Number | Four |
| Type | Balanced |
| Impedance | >15K Ω |
| Maximum Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 4 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 24

## SD SDI to Analog Converter and Disembedder

BrightEye 24 is both a disembedder (demultiplexer) and a digital to analog video converter. The incoming serial digital video signal is converted to an analog composite output. Audio signals present in the incoming digital video signal are extracted and delivered as four channels of analog audio.

Audio mixing, level adjustments, and channel shuffling are accessed through BrightEye Mac or PC software. Audio group selection is also made through BrightEye Mac or PC software. A variety of audio connectors and adapters are available for integrating BrightEye 24 to any type of system. Use BrightEye 24 in desktop and broadcast applications.

- Use with Servers, VTRs and Workstations
- Disembedder and Converter
- Embedded SDI Input
- Analog Audio Output
- Composite Video Output

## Specifications

### Video Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |
| Automatic Input Cable Equalization | |

### Video Output

| | |
|---|---|
| Number | One |
| Type | NTSC or PAL Composite Standard follows input |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Output DC | <50 mV |

### SDI to Analog Performance

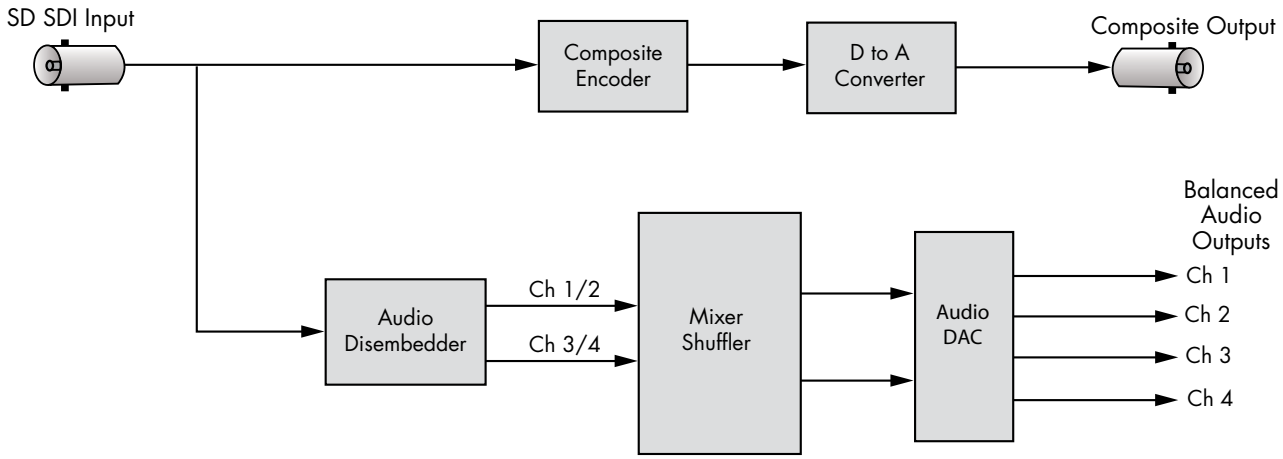
| | |
|---|---|
| Bit Resolution | 10 bit output reconstruction 2 x oversampling |
| Signal to Noise | >65 dB |
| Frequency Response | ± 0.1 dB, 0 to 5.5 MHz |
| K Factor | <1% |
| Differential Phase | <1 degree |
| Differential Gain | <1% |

### Analog Audio Outputs

| | |
|---|---|
| Number | Four |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |
| Resolution | 24 bits, 128 x oversampled |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 4 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 25

## Analog Video / Audio to SD SDI Converter with TBC and Embedder

BrightEye 25 converts analog composite video to SD SDI, with simultaneous conversion of four channels of audio and embedding. A TBC/Frame Sync is a standard feature and allows this BrightEye to work with any sort of video input. Great for broadcast and desktop applications, BrightEye 25 can be used with sources such as VTRs and incoming satellite feeds.

The analog input is converted at 12 bits of resolution and digitally decoded to 10 bit YCrCb components. The signal is then time base corrected and frame synchronized to the reference input. The audio is converted to digital and then it passes through the built-in four channel mixer with shuffle and level control. The video and audio signals join up in an embedder which can be targeted to any of the four groups.

Basic controls are accessed on the front panel. BrightEye Mac or PC software provides access to video proc functions and the built-in audio mixer. The vertical interval can be passed or blanked. VU indication is provided on the front panel and through BrightEye Mac or PC software.

- Convert Analog Sources to Embedded SDI
- Analog Audio and Video Inputs
- Embedded SDI Output
- TBC and Frame Sync
- 12 and 24 Bit Processing

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | NTSC, PAL Composite |
| Impedance | 75 Ω |
| Return Loss | >40 dB, DC to 5.5Mhz |
| Input | DC +/-1 volt DC |
| Input Hum | <100 mV |

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video, PAL or NTSC |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Type | 270 Mb/s SD Serial Digital SMPTE 259M |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output | DC None (AC coupled) |

### Analog Video to SDI Performance

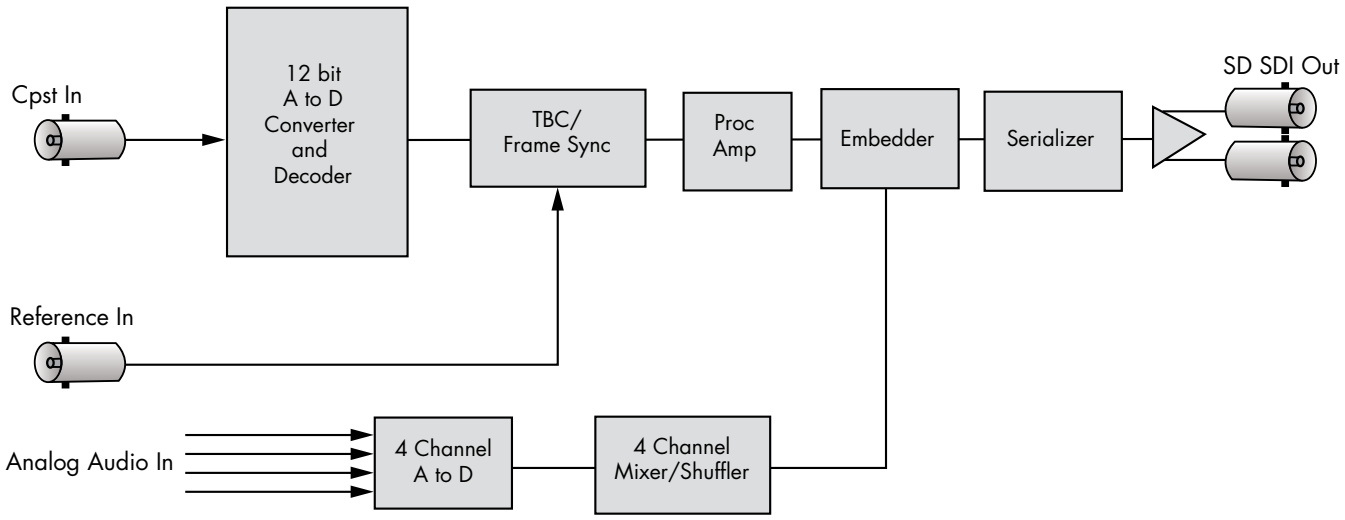
| | |
|---|---|
| Bit Resolution | 12 bit input quantization, 4 x oversampling |
| Decoding | Adaptive Comb Filter, 3 or 5 line selectable |
| Signal to Noise | >62 dB, weighted |
| Frequency Response | ±0.1 dB, 0 to 5.5 MHz |

### Analog Audio Inputs

| | |
|---|---|
| Number | Four |
| Type | Balanced |
| Impedance | >15K Ω |
| Maximum Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 5 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 26

## Analog Video / Audio to SD SDI / Optical Converter with TBC and Embedder

BrightEye 26 converts analog composite video to SD SDI, with simultaneous conversion of four channels of audio and embedding. It is similar to the BrightEye 25, with the addition of an optical output. A TBC/Frame Sync is a standard feature and allows this BrightEye to work with any sort of video input. Great for broadcast and desktop applications, BrightEye 26 can be used with sources such as VTRs and incoming satellite feeds.

The analog input is converted at 12 bits of resolution and digitally decoded to 10 bit YCrCb components. The signal is then time base corrected and frame synchronized to the reference input. The audio is converted to digital and then it passes through the built-in four channel mixer with shuffle and level control. The video and audio signals join up in an embedder which can be targeted to any of the four groups.

Basic controls are accessed on the front panel. BrightEye Mac or PC software provides access to video proc functions and the built-in audio mixer. The vertical interval can be passed or blanked. VU indication is provided on the front panel and through BrightEye Mac or PC software.

- Optical Transmitter
- Convert Analog Sources to Embedded SDI
- Analog Audio and Video Inputs
- Embedded SDI Output
- TBC and Frame Sync
- 12 and 24 Bit Processing

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | NTSC, PAL Composite |
| Impedance | 75 Ω |
| Return Loss | >40 dB, DC to 5.5Mhz |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video, PAL or NTSC |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output | DC None (AC coupled) |

### Optical Output

| | |
|---|---|
| Number | One |
| Type | SD (SMPTE 297M, optical equivalent of 259M) |
| Wavelength | 1310 nm (1550 by special order) |
| Power | –7 dBm |
| Maximum length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | SC |

### Analog Video to SDI Performance

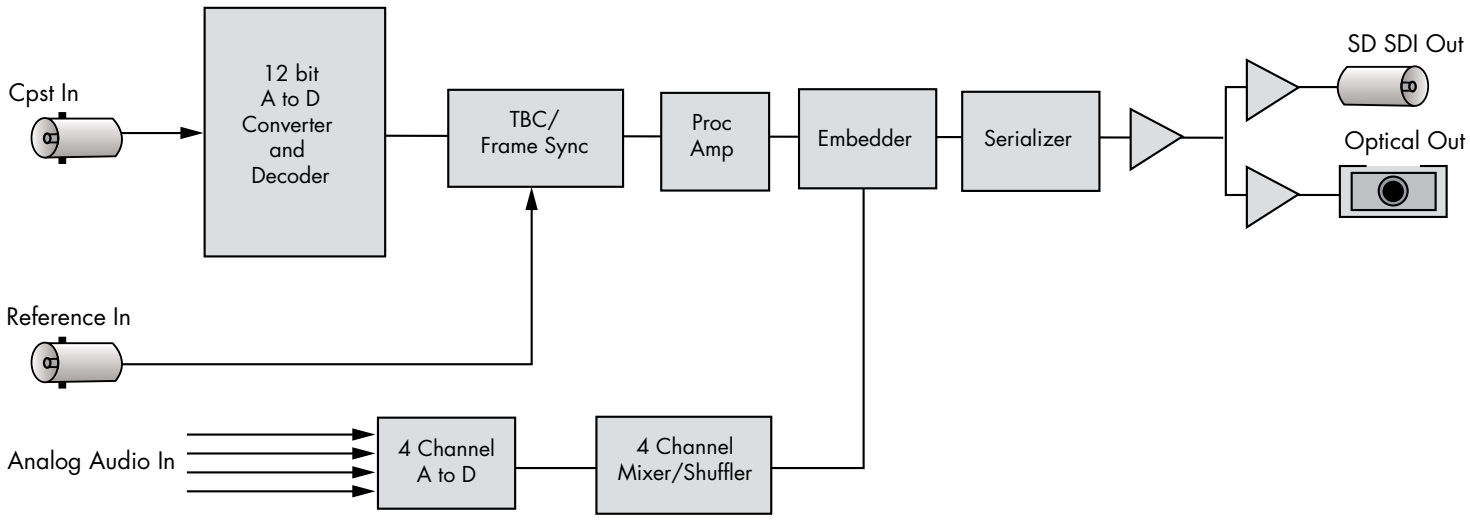
| | |
|---|---|
| Bit Resolution | 12 bit input quantization, 4 x oversampling |
| Decoding | Adaptive Comb Filter, 3 or 5 line selectable |
| Signal to Noise | >62 dB, weighted |
| Frequency Response | ±0.1 dB, 0 to 5.5 MHz |

### Analog Audio Inputs

| | |
|---|---|
| Number | Four |
| Type | Balanced |
| Impedance | >15K Ω |
| Max Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu to +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 5 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |



# BrightEye 30

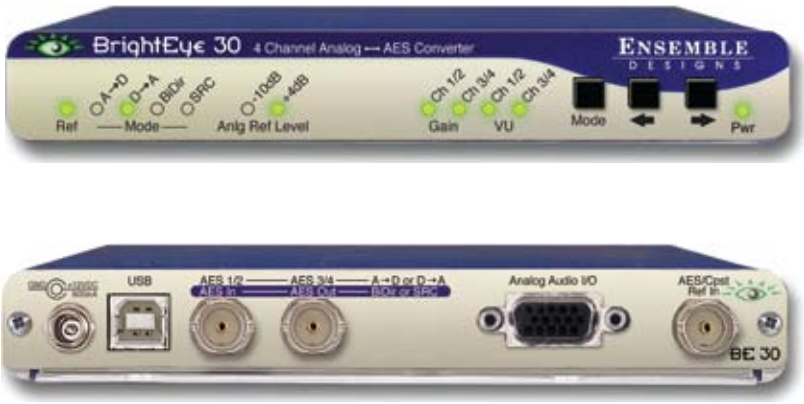
## Audio ADC and DAC, Bi-directional

BrightEye 30 is a flexible audio converter that can be a two channel, bi-directional ADC and DAC, or it can be configured as a four channel converter. Perfect in desktop, post and broadcast applications, 24 bit processing ensures beautiful audio.

As a bi-directional converter, two channels of analog audio are converted to AES digital audio and at the same time an AES stream is converted to two channels of analog.

Alternately, the unit can be configured as a four channel AES to analog converter or a four channel analog to AES converter.

BrightEye 30 also serves as a sample rate converter. For example, a digital 44.1 KHz signal from a CD player can be fed to the input and a digital AES3id, 48 KHz signal synchronous to the reference input will be output.




Audio mixing, level adjustments, and channel shuffling are accessed through BrightEye Mac or PC software. A variety of audio connectors and adapters are available for integrating BrightEye 30 to any type of system.

A reference input is provided which allows digital outputs to be synchronized to either a PAL or NTSC video signal or AES reference.

- 2 or 4 Channel Audio Converter
- Analog and Digital Inputs
- Analog and Digital Outputs
- Bi-directional ADC/DAC
- Sample Rate Converter

## Specifications

### Analog Audio Inputs

| | |
|---|---|
| Number | Four (selectable as inputs or outputs) |
| Type | Balanced |
| Impedance | >15K Ω |
| Maximum Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### AES/EBU Digital Inputs

| | |
|---|---|
| Number | Two (total of four channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 96 KHz (Sample Rate Converted internally to 48 KHz) |
| Reference Level | -18 or -20 dBFS (selectable) |
| AC-3, Dolby-E | Supported when inputs are synchronous |

### Analog Audio Outputs

| | |
|---|---|
| Number | Four (selectable as inputs or outputs) |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |
| Resolution | 24 bits, 128 x oversampled |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### AES/EBU Digital Outputs

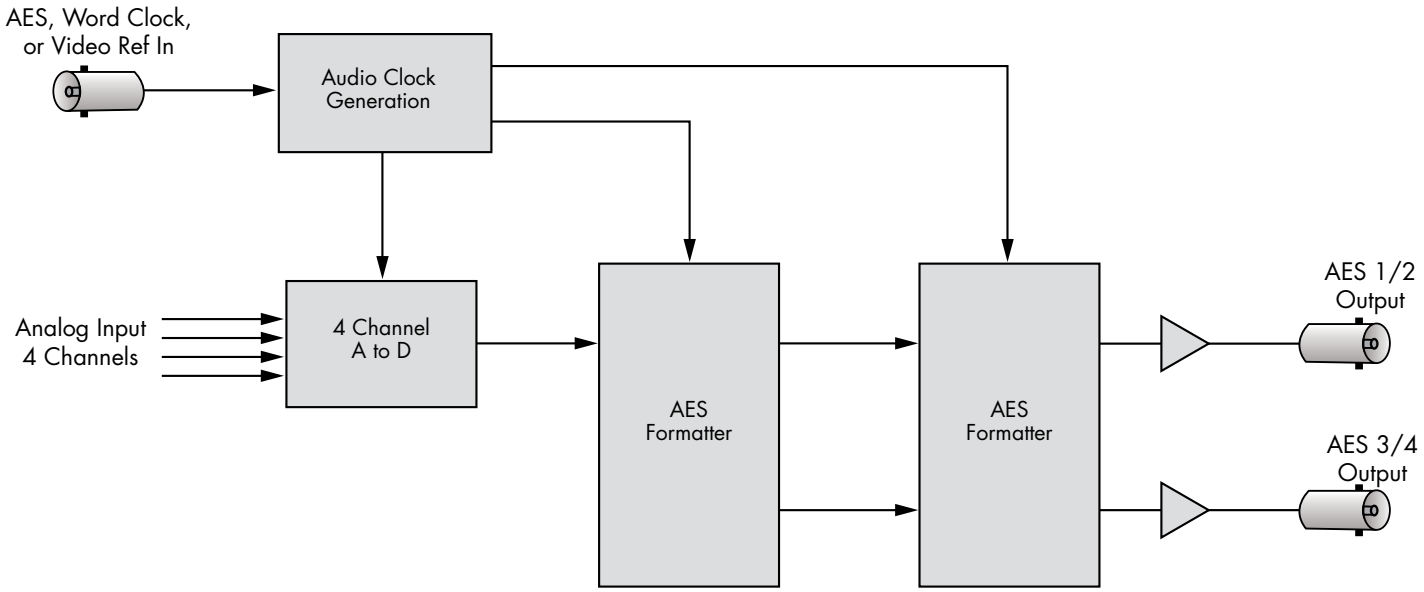
| | |
|---|---|
| Number | Two (total of four channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 24 Bit |
| Sample Rate | 48 KHz Synchronous to Video output |
| Reference Level | -18 or -20 dBFS (selectable) |

### General Specifications

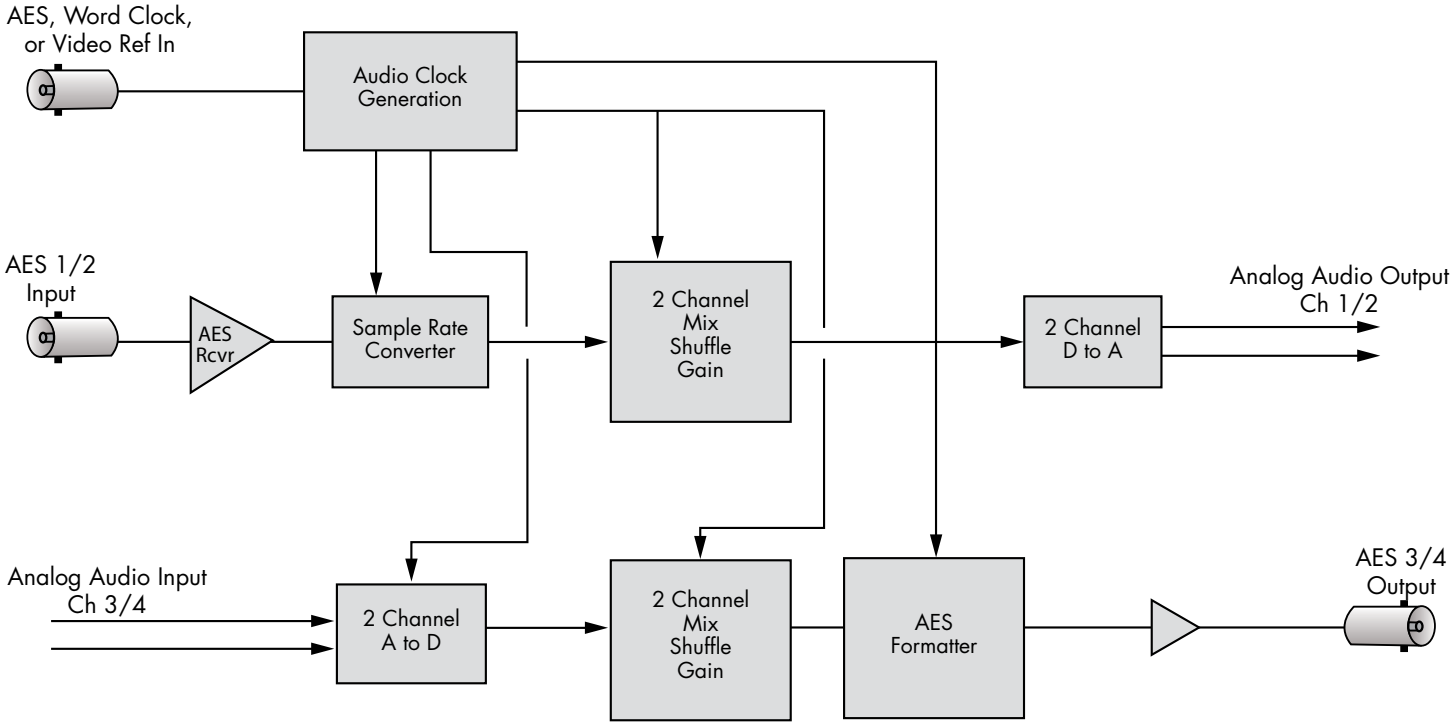
| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 2 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |

BrightEye 30 Block Diagrams on following pages

## ADC Mode

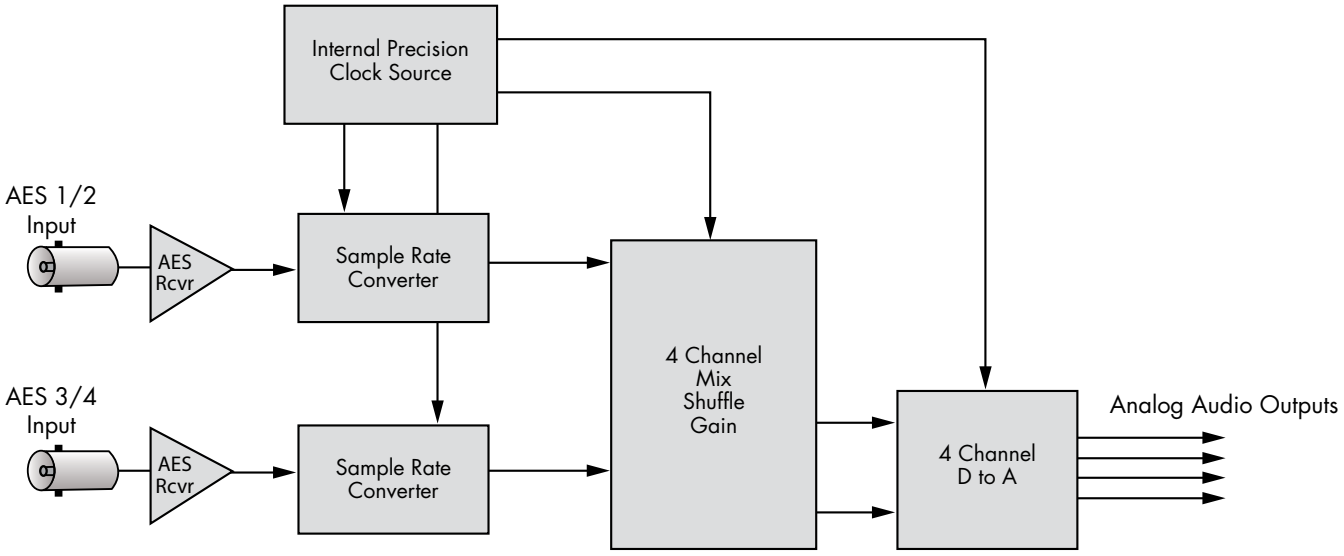



## BiDirectional Mode

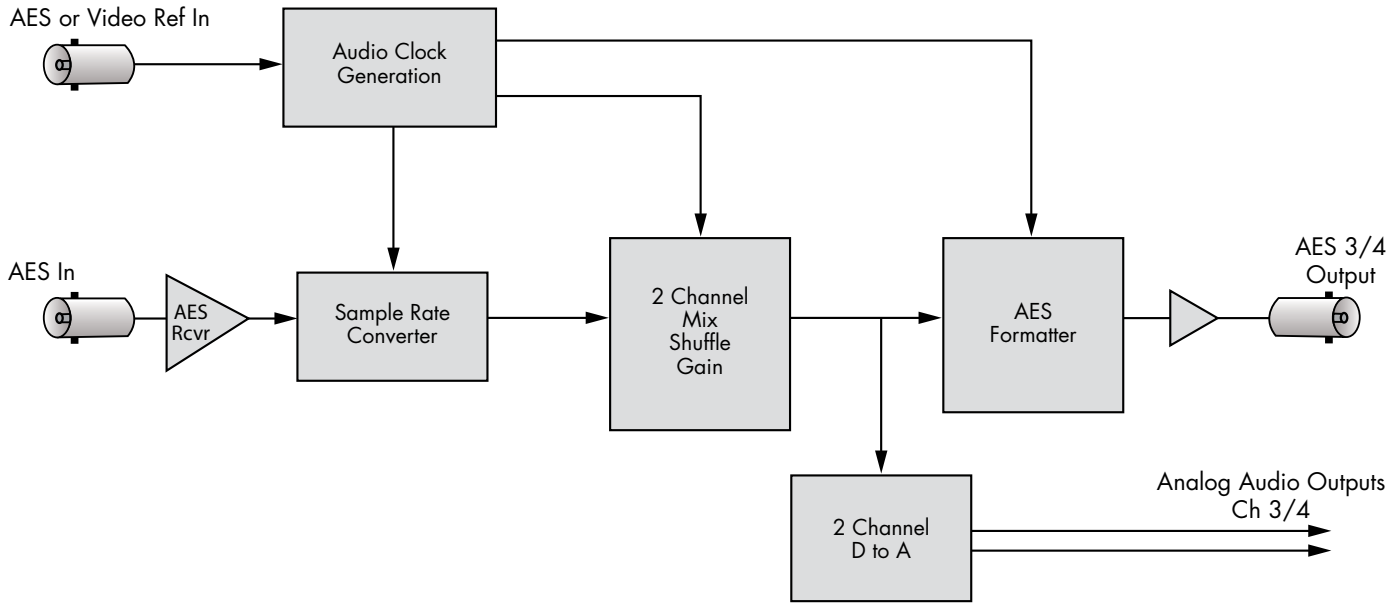



BiDirectional mode provides two independent paths, one is analog to digital conversion, the other is digital to analog.

## DAC Mode




## SRC Mode



# BrightEye 30-D

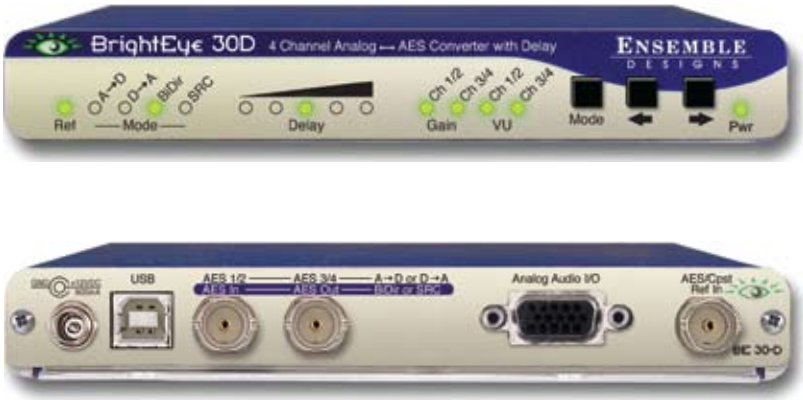
## Audio ADC and DAC, Bi-directional Converter with Delay

BrightEye 30-D is a flexible audio converter that can be a two channel, bi-directional ADC and DAC, or it can be configured as a four channel converter. Perfect in desktop, post and broadcast applications, 24 bit processing ensures beautiful audio.

As a bi-directional converter, two channels of analog audio are converted to AES digital audio and at the same time an AES stream is converted to two channels of analog.

Alternately, the unit can be configured as a four channel AES to analog converter or a four channel analog to AES converter.

BrightEye 30-D also serves as a sample rate converter. For example, a digital 44.1 KHz signal from a CD player can be fed to the input and a digital AES3id, 48 KHz signal synchronous to the reference input will be output.




Audio mixing, level adjustments, channel shuffling and delay are accessed through BrightEye PC and BrightEye Mac. Audio delay adjustments simplify signal integration. A variety of audio connectors and adapters are available for integrating BrightEye 30-D to any type of system.

A reference input is provided which allows digital outputs to be synchronized to either a PAL or NTSC video signal or AES reference.

- 2 or 4 Channel Audio Converter
- Analog and Digital Inputs
- Analog and Digital Outputs
- Bi-directional ADC/DAC
- Sample Rate Converter
- Adjustable Audio Delay

## Specifications

### Analog Audio Inputs

| | |
|---|---|
| Number | Four (selectable as inputs or outputs) |
| Type | Balanced |
| Impedance | >15K Ω |
| Maximum Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### AES/EBU Digital Inputs

| | |
|---|---|
| Number | Two (total of four channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 96 KHz (Sample Rate Converted internally to 48 KHz) |

### Analog Audio Outputs

| | |
|---|---|
| Number | Four (selectable as inputs or outputs) |
| Type | Balanced, transformerless |
| Delay Adjustment Range | 5 to 1000 msec |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |
| Resolution | 24 bits, 128 x oversampled |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### AES/EBU Digital Outputs

| | |
|---|---|
| Number | Two (total of four channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 24 Bit |
| Sample Rate | 48 KHz<br>Synchronous to Video output |
| Reference Level | -18 or -20 dBFS (selectable) |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 3 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |

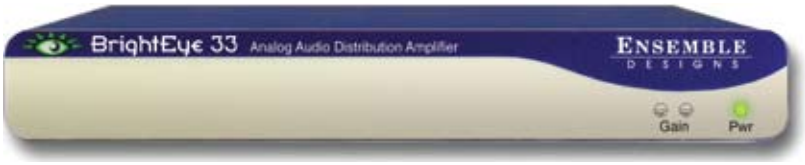
BrightEye 30-D Block Diagrams on previous pages

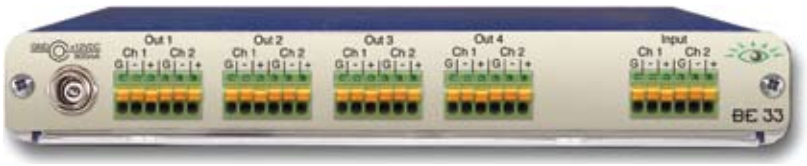
# BrightEye 33

## Analog Audio Distribution Amplifier

BrightEye 33 is a high performance audio distribution amplifier for the broadcast and recording industry. Exceptional performance features include excellent response, noise and distortion specifications. BrightEye 33 functions with either 8 mono outputs or 4 stereo outputs.

Gain adjustments are accessed from the front panel. This is a simple device with no USB port and no interface to BrightEye Mac or PC software.




- Analog audio DA for braodcast and post
- 8 mono outputs or 4 stereo outputs
- Gain adjustments from the front panel

## Specifications

### Analog Audio Inputs

| | |
|---|---|
| Number | Two |
| Type | Balanced |
| Impedance | >15K Ω |
| Maximum Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |

### Analog Audio Outputs

| | |
|---|---|
| Number | Four stereo or eight mono |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |

### Performance

| | |
|---|---|
| Gain Range | ±6 dB |
| Frequency Response | <±0.1 dB, 20 Hz to 20 KHz |
| Isolation | >100 dB |
| S/N Ratio | >100 dB, unweighted |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 4 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95% non-condensing |
| Altitude | 0 to 10,000 ft. |

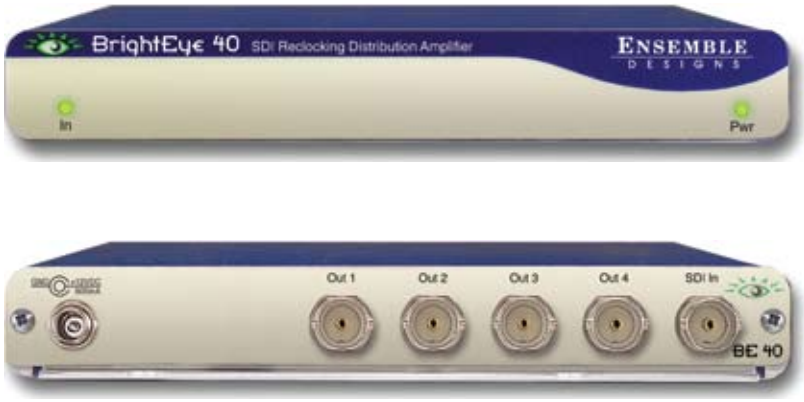
# BrightEye 40

## SD SDI Reclocking Distribution Amplifier

BrightEye 40 is a reclocking serial digital video distribution amplifier with four outputs. The SD SDI input will automatically equalize up to 300 meters (1000 feet) of digital cable. Following equalization, the 270 Mb/s SD SDI input signal is reclocked before being delivered to four simultaneous SD SDI outputs.

When using an analog to digital video converter and multiple outputs are needed, BrightEye 40 can be used to distribute and provide those additional output signals. BrightEye 40 works well with video converters BrightEye 3 and BrightEye 25. BrightEye 40 is also useful in conjunction with the BrightEye 54 sync pulse generator and test signal generator for distributing digital test signals.

This is a simple device with no USB port and no interface to BrightEye Mac or PC software. Front panel indicators show the presence of an input signal and power.




- Use with Converters and SPGs in order to have more outputs
- DA for SD SDI
- Passes Embedded Audio

## Specifications

### Serial Input

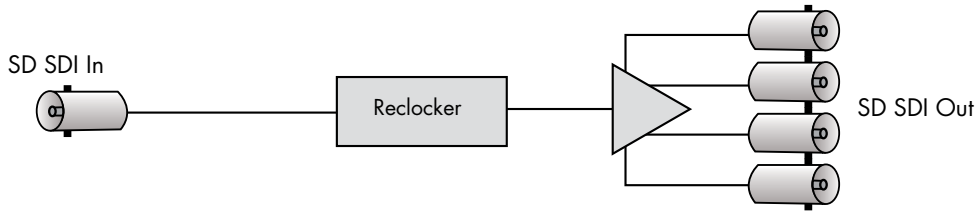
| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital SMPTE 259M |
| Impedance | 75 Ω |
| Return Loss | >15dB |
| Max Cable Length | 300 meters |

### Serial Output

| | |
|---|---|
| Number | Four |
| Signal Type | Serial Digital SMPTE 259M |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 3 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |



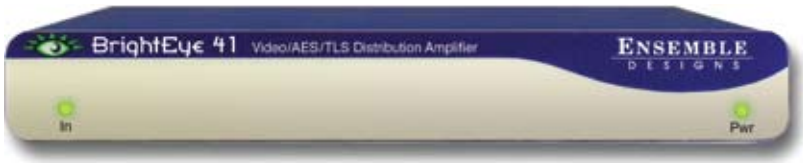
# BrightEye 41

## Video / AES / Tri-Level Sync Distribution Amplifier

BrightEye 41 is a distribution amplifier that accepts analog video, AES digital audio, or HD Tri-Level Sync signal. It can also be used with SMPTE 310M, Dolby E and A3 signals. It provides unity gain fanout over a frequency range of DC to 10 Mhz. It can handle composite and component analog video, coaxial AES digital audio, or a High Definition Tri-Level Sync signal.

When using a digital to analog video converter and multiple outputs are needed, BrightEye 41 can be used to distribute and provide those additional output signals. BrightEye 41 works well with video converters BrightEye 10 and BrightEye 16. BrightEye 41 is also useful in conjunction with the BrightEye 54 sync pulse generator and test signal generator for distributing Tri-Level Sync, AES and composite signals.

This is a simple device, with no USB port and no interface to BrightEye Mac or PC software. Front panel indicators show the presence of an input signal and power.



- Use with Converters and SPGs in Order to Have More Outputs
- DA for Analog Video Signals
- DA for High Definition Tri-Level Sync
- DA for AES Digital Audio, AC3 and Dolby E
- DA for SMPTE 310M

## Specifications

### Input Signal

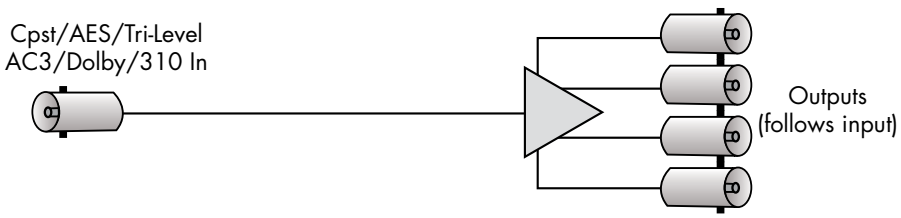
| | |
|---|---|
| Number | One, terminating |
| Signal Type | NTSC/525, PAL/625<br>Composite video, AES digital audio or HD Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB to 5 MHz |

### Output Signal

| | |
|---|---|
| Number | Four |
| Signal Type | Follows Input |
| Impedance | 75 Ω |
| Return Loss | >40 dB to 5 MHz |
| DC offset | Follows input +/- 50 mV |
| Delay | 10 ns (14° NTSC, 17° PAL) |
| Frequency Response | ±0.1 dB, 0 to 5.5 MHz<br>±0.3 dB, 0 to 10 MHz |
| Signal to Noise | 68 dB |
| K Factor | 2T Pulse <0.25% |
| Differential Phase | 10-90% apl <0.1 deg |
| Differential Gain | 10-90% apl <0.15% |
| Gain Stability | <0.2 dB variation over operating temp |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| | Power 12 volts, 1 watt (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

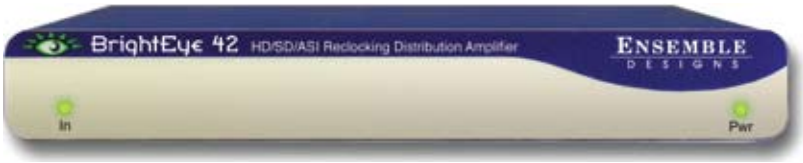


# BrightEye 42

## HD / SD / ASI Distribution Amplifier

BrightEye 42 is a reclocking distribution amplifier that can be used with high definition, standard definition or ASI signals. When used with SD or ASI input signals, the serial input automatically equalizes up to 300 meters of digital cable. When used with an HD input signal, the serial input automatically equalizes up to 100 meters of digital cable. The equalized signal is reclocked and delivered to four simultaneous outputs. The reclocker is ASI compliant and all four outputs have the correct ASI polarity.

This is a simple device with no USB port and no interface to BrightEye Mac or PC software. Front panel indicators show the presence of an input signal and power.



- Use with Video Converters and TSGs in Order to Have More Outputs
- DA for Digital HD or SD SDI Signals
- DA for ASI Signals
- Passes Embedded Audio

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) or 1.485 Gb/s HD Serial Digital (SMPTE 274M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s |

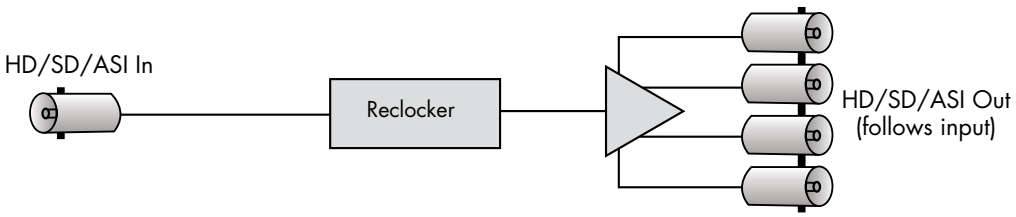
Automatic Input Cable Equalization

### Serial Digital Output

| | |
|---|---|
| Number | Four |
| Signal Type | HD/SD/ASI Serial Digital (SMPTE 259M or SMPTE 274M, 292M or 296M), follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 2 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

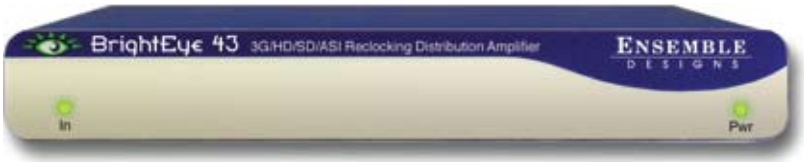


# BrightEye 43

## 3G / HD / SD / ASI Distribution Amplifier

BrightEye 43 is a reclocking distribution amplifier that can be used with standard definition video signals, 3 Gb/s and 1.5 Gb/s high definition signals, or ASI signals. The signal is equalized, reclocked and delivered to the outputs.

This is a simple device with no USB port and no interface to BrightEye Mac or PC software. Front panel indicators show the presence of an input signal and power.



- Use with Video Converters and TSGs in Order to Have More Outputs
- DA for Digital HD or SD Signals
- DA for 3G HD, Level A or Level B
- DA for ASI Signals
- Passes Embedded Audio

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M)<br>1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M)<br>2.97 Gb/s HD Serial Digital (SMPTE 424M, 425M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s<br>70 meters for 2.97 Gb/s<br>(Belden 1694A) |

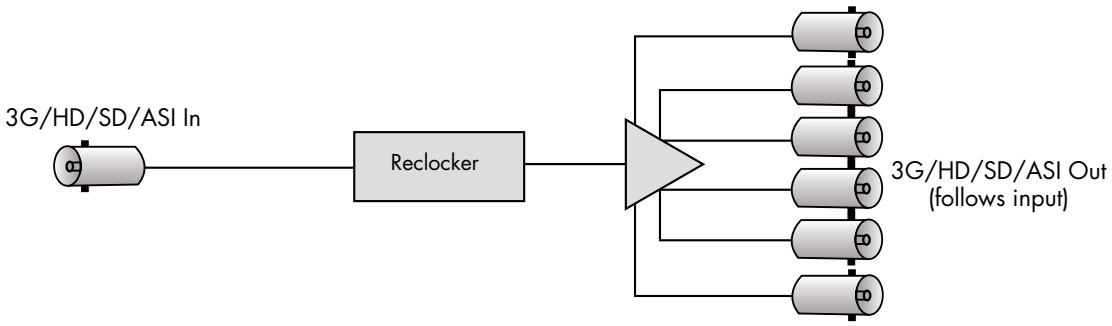
Automatic Input Cable Equalization

### Serial Digital Output

| | |
|---|---|
| Number | Six (Three for ASI) |
| Signal Type | 3G/HD/SD/ASI Serial Digital follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Output DC | None (AC coupled) |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 7 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

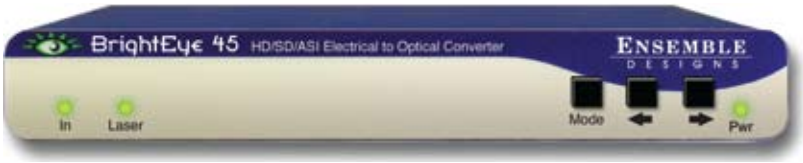


# BrightEye 45

## HD / SD / ASI Electrical to Optical Converter

BrightEye 45 is an electrical to optical converter and distribution amplifier that can be used with high definition, standard definition or ASI signals. The video input is reclocked and presented on four BNCs and is also converted to an optical signal and presented on an optical SC connector. This optical output can drive single mode fiber to a distance of 20 kilometers. With an optical launch power attenuator, multi-mode fiber can also be used with BrightEyes.

This is a simple device with no USB port and no interface to BrightEye Mac or PC software. Front panel indicators show the presence of an input signal and power.



- Optical Transmitter
- Electrical to Optical Converter
- Use with HD or SD signals
- Use with ASI Signals
- Serves as a Distribution Amplifier
- Passes Embedded Audio

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) or 1.485 Gb/s HD Serial Digital (SMPTE 274M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15dB |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s |

Automatic Input Cable Equalization

### Serial Digital Output

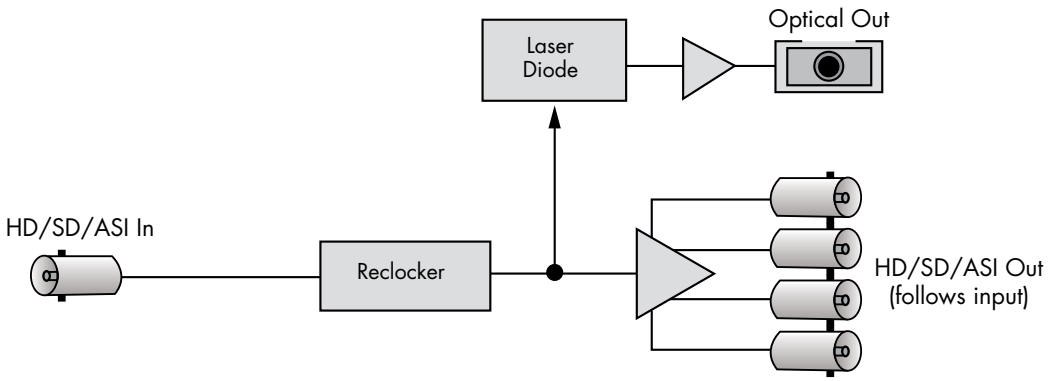
| | |
|---|---|
| Number | Four |
| Signal Type | HD/SD/ASI Serial Digital (SMPTE 259M or SMPTE 274M or 296M), follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### Optical Output

| | |
|---|---|
| Number | One |
| Type | SD and ASI (SMPTE 297M, optical equivalent of 259M)<br>HD (SMPTE 274M, 292M or 296M) |
| Wavelength | 1310 nm (1550 by special order) |
| Power | -7 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | SC |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 3 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

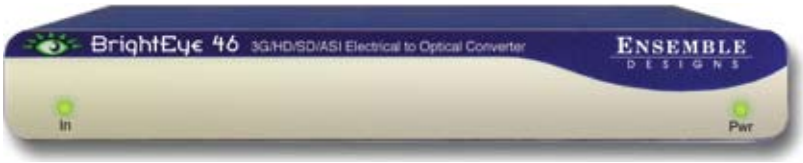


# BrightEye 46

## 3G / HD / SD / ASI Electrical to Optical Converter

BrightEye 46 is an electrical to optical converter and distribution amplifier that can be used with standard definition video signals, 3 Gb/s and 1.5 Gb/s high definition signals, or ASI signals. The video input is reclocked and presented on four BNCs and is also converted to an optical signal and presented on an optical LC connector. This optical output can drive single mode fiber to a distance of 20 kilometers. With an optical launch power attenuator, multi-mode fiber can also be used with BrightEyes.

This is a simple device with no USB port and no interface to BrightEye Mac or PC software. Front panel indicators show the presence of an input signal and power.



- Optical Transmitter
- Electrical to Optical Converter
- Use with HD or SD signals
- Use with ASI Signals
- 3G HD, Level A or Level B supported
- Serves as a Distribution Amplifier
- Passes Embedded Audio

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M)<br>1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M)<br>2.97 Gb/s HD Serial Digital (SMPTE 424M, 425M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s<br>70 meters for 2.97 Gb/s<br>(Belden 1694A) |

Automatic Input Cable Equalization

### Serial Digital Output

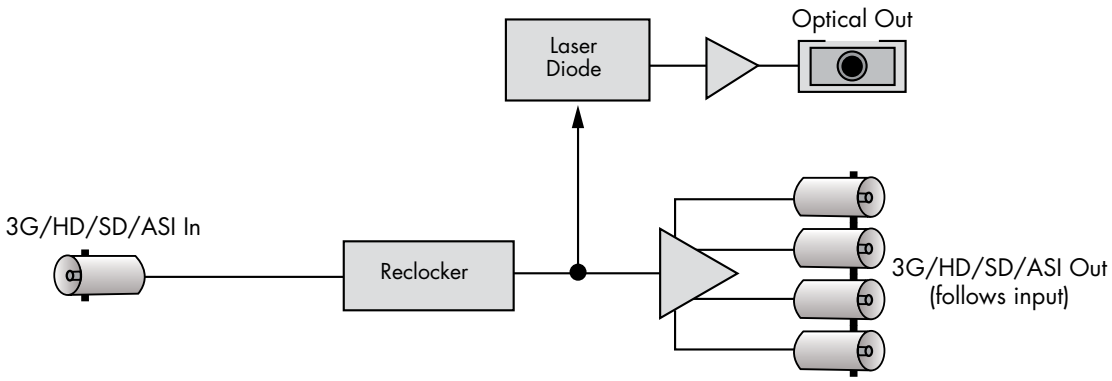
| | |
|---|---|
| Number | Four |
| Signal Type | 3G/HD/SD/ASI Serial Digital follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Output DC | None (AC coupled) |

### Optical Output

| | |
|---|---|
| Number | One |
| Type | SD and ASI (SMPTE 297M, optical equivalent of 259M)<br>1.485 Gb/s HD (SMPTE 274M, 292M or 296M)<br>2.97 Gb/s HD (SMPTE 424M, 425M) |
| Wavelength | 1310 nm (1550 by special order) |
| Power | -7 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | LC/UPC |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 7 watts<br>(100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

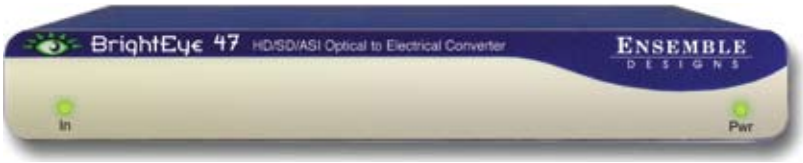


# BrightEye 47

## HD / SD / ASI Optical to Electrical Converter

BrightEye 47 is an optical to electrical converter that supports HD, SD, and ASI data rates. The optical input is converted to electrical form and the resulting serial digital signal is reclocked and delivered to BNC outputs. Providing four electrical outputs, the BrightEye 47 also serves as a distribution amplifier. An input status indicator shows whether a proper optical signal is detected at the converter input. Combine with a BrightEye 45 for a complete transmission chain.

This is a simple device with no USB port and no interface to BrightEye Mac or PC software. Front panel indicators show the presence of an input signal and power.



- Optical Receiver
- Optical to Electrical Converter
- Use with HD or SD Signals
- Use with ASI Signals
- Serves as a Distribution Amplifier
- Passes Embedded Audio

## Specifications

### Optical Input

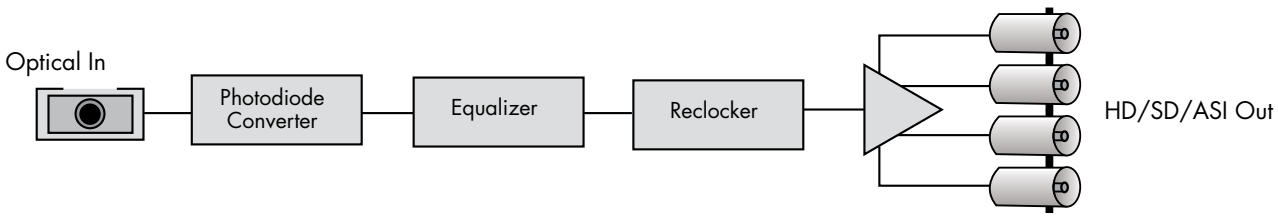
| | |
|---|---|
| Number | One |
| Type | SD and ASI<br>(SMPTE 297M, optical equivalent of 259M)<br>HD (SMPTE 274M or 296M) |
| Wavelength | 830 to 1550 nm |
| Receiver Sensitivity | SD and ASI: -18 dBm<br>HD: -18 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | SC |

### Serial Digital Output

| | |
|---|---|
| Number | Four |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) or 1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15dB |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D<br>(143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 2 watts<br>(100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

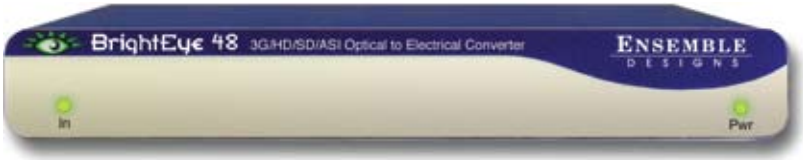


# BrightEye 48

## 3G / HD / SD / ASI Optical to Electrical Converter

BrightEye 48 is an optical to electrical converter that can be used with standard definition video signals, 3 Gb/s and 1.5 Gb/s high definition signals, or ASI signals. The optical input is converted to electrical form and the resulting serial digital signal is reclocked and delivered to BNC outputs. Providing six electrical outputs, the BrightEye 48 also serves as a distribution amplifier. An input status indicator shows whether a proper optical signal is detected at the converter input.

This is a simple device with no USB port and no interface to BrightEye Mac or PC software. Front panel indicators show the presence of an input signal and power.



- Optical Receiver
- Optical to Electrical Converter
- Use with HD or SD Signals
- 3G HD, Level A or Level B supported
- Use with ASI Signals
- Serves as a Distribution Amplifier
- Passes Embedded Audio

## Specifications

### Optical Input

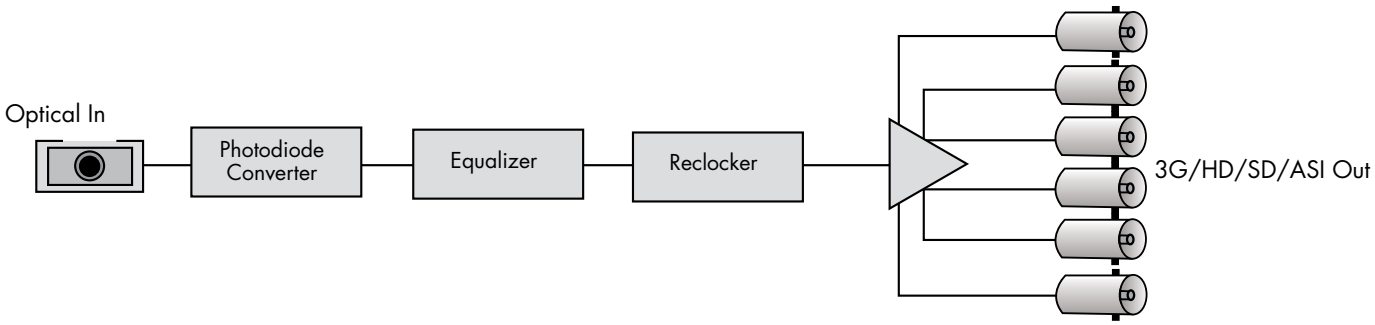
| | |
|---|---|
| Number | One |
| Type | SD and ASI<br>(SMPTE 297M, optical equivalent of 259M)<br>1.485 Gb/s Gb/s HD Serial Digital<br>(SMPTE 274M, 272M or 296M)<br>2.97 Gb/s HD Serial Digital<br>(SMPTE 424M, 425M) |
| Wavelength | 830 to 1550 nm |
| Receiver Sensitivity | SD and ASI: -18 dBm<br>HD: -18 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | LC/UPC |

### Serial Digital Output

| | |
|---|---|
| Number | Six |
| Signal Type | Follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s<br>70 meters for 2.97 Gb/s<br>(Belden 1694A) |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D<br>(143 mm x 20 mm x 140 mm)<br>including connectors |
| Power | 12 volts, 7 watts<br>(100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |



# BrightEye 54

## Sync Generator and Test Signal Generator

BrightEye 54 is a master sync generator and test signal generator that is perfect as a master reference generator for remote trucks, desktop and fly packs. It is a stable timing source, operating from an internal precision standard that meets full broadcast specifications.

Color Black, Bars, Crosshatch, Multiburst, and SDI Checkfield (Pathological) are just some of the signals simultaneously available on the SDI and analog composite outputs.

An ID slate with user programmable text can overlay the test pattern. The cyclops feature adds a motion element to the video test signal, handy for live applications.

The HD Tri-Level Sync output provides reference to high definition equipment, such as VTRs, disc recorders and workstations. There are a wide variety of user selectable formats including: 720p, 1080i, 1080sF, and 1080p. Format selections and other controls are accessed through BrightEye Mac or PC software.

AES3id digital audio, analog audio and embedded audio reference outputs are provided.

- Reference Generator for All Video and Audio Gear
- Sync Pulse Generator
- Test Signal Generator
- Composite, SD SDI, HD Tri-Level Outputs
- Audio Outputs

## Specifications

### Composite Output

| | |
|---|---|
| Number | One |
| Signal Type | NTSC / PAL |
| Impedance | 75 Ω |
| Return Loss | >40 dB DC to 5.5 MHz |
| Frequency Response | -0.1 dB 10 KHz to 5.0 MHz |
| Output DC | ±50 mV |
| K Factor | <1.0% |
| Differential Phase | <1.0 degree |
| SCH Phase | ±5 degrees |

### Accuracy and Timing Stability

| | |
|---|---|
| Internal TCXO | |
| PAL Fsc | 4.43361875 MHz +/- 1 Hz |
| NTSC Fsc | 3.579545 MHz +/- 1 Hz |
| 601 Fs | 27.000000 MHz +/- 5 Hz |
| Long Term Drift | <1 ppm/year |
| Analog Jitter | <1 ns |
| Digital Jitter | <0.2 UI (0.13 UI typical) |

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Signal Type | Serial Digital (SMPTE 259M) |
| Return Loss | >15 dB, DC to 270 MHz |

### AES Audio Output

| | |
|---|---|
| Number | One |
| Type | AES3id, 1 KHz tone or silence |
| Resolution | 24 bit |

### Analog Audio Output

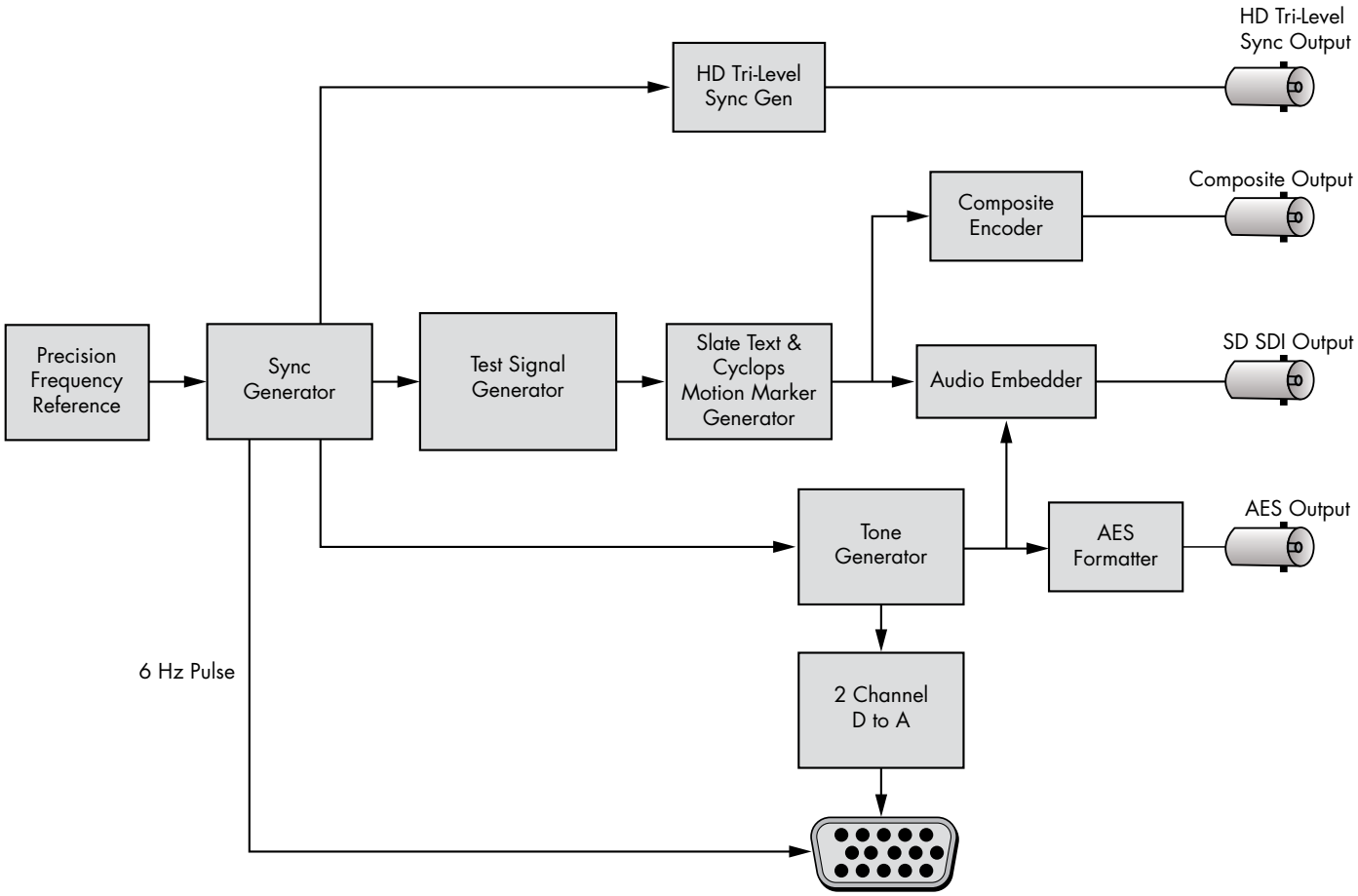
| | |
|---|---|
| Number | One stereo pair or two mono |
| Type | 1 KHz tone or silence |
| Impedance | 30 Ω, balanced |
| Reference Level | -10 to + 4 dBu, adjustable |

### Tri-Level Sync Output

| | |
|---|---|
| Number | One, 75 Ω |
| Type | 1080i (SMPTE 274M -5, 6) 50, 59.94<br>720p (SMPTE 296M -2, 3) 50, 59.94<br>1080p (SMPTE 274M -9, 11) 23.98, 24, 25 Hz<br>1080sF (RP211 -14, 16) 23.98, 24, 25 Hz |
| Output DC | ±50 mV |
| Return Loss | >30 dB to 30 MHz |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 4 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 55

## Genlockable Sync Generator and Test Signal Generator

BrightEye 55 is a genlockable sync generator and test signal generator that can be used as either a slave or master reference generator. It can lock to house reference or it can lock to its own internal precision standard. BrightEye 55 is well suited for remote trucks, desktop and fly packs.

Color Black, Bars, Crosshatch, Multi-burst, and SDI Checkfield (Pathological) are just some of the signals simultaneously available on the SDI and analog composite outputs.

An ID slate with user programmable text can overlay the test pattern. The cyclops feature adds a motion element to the video test signal, handy for live applications.

The HD Tri-Level Sync output provides reference to high definition equipment, such as VTRs, disc recorders and workstations. There are a wide variety of user selectable formats including: 720p, 1080i, 1080sF, and 1080p. Format selections and other controls are accessed through BrightEye Mac or PC software.

AES3id digital audio, analog audio and embedded audio reference outputs are provided.

- Master or Slave Reference Generator for All Video and Audio Gear
- Sync Pulse Generator
- Test Signal Generator
- Composite, SD SDI, HD Tri-Level Outputs
- Audio Outputs

## Specifications

### Reference Input

| | |
|---|---|
| Number | One |
| Signal Type | 1V P-P PAL, NTSC, or 10 MHz |
| Return Loss | >40 dB DC to 5.5 MHz |

### Composite Output

| | |
|---|---|
| Number | One |
| Signal Type | NTSC / PAL |
| Impedance | 75 Ω |
| Return Loss | >40 dB DC to 5.5 MHz |
| Frequency Response | -0.1 dB 10 KHz to 5.0 MHz |
| Output DC | ±50 mV |
| K Factor | <1.0% |
| Differential Phase | <1.0 degree |
| SCH Phase | ±5 degrees |

### Accuracy and Timing Stability

| | |
|---|---|
| Internal TCXO | |
| PAL Fsc | 4.43361875 MHz +/- 1 Hz |
| NTSC Fsc | 3.579545 MHz +/- 1 Hz |
| 601 Fs | 27.000000 MHz +/- 5 Hz |
| Long Term Drift | <1 ppm/year |
| Analog Jitter | <1 ns |
| Digital Jitter | <0.2 UI (0.13 UI typical) |

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Signal Type | Serial Digital (SMPTE 259M) |
| Return Loss | >15 dB, DC to 270 MHz |

### Tri-Level Sync Output

| | |
|---|---|
| Number | One, 75 Ω |
| Type | 1080i (SMPTE 274M -5, 6) 50, 59.94<br>720p (SMPTE 296M -2, 3) 50, 59.94<br>1080p (SMPTE 274M -9, 11) 23.98, 24, 25 Hz<br>1080sF (RP211 -14, 16) 23.98, 24, 25 Hz |
| Output DC | ±50 mV |
| Return Loss | >30 dB to 30 MHz |

### AES Audio Output

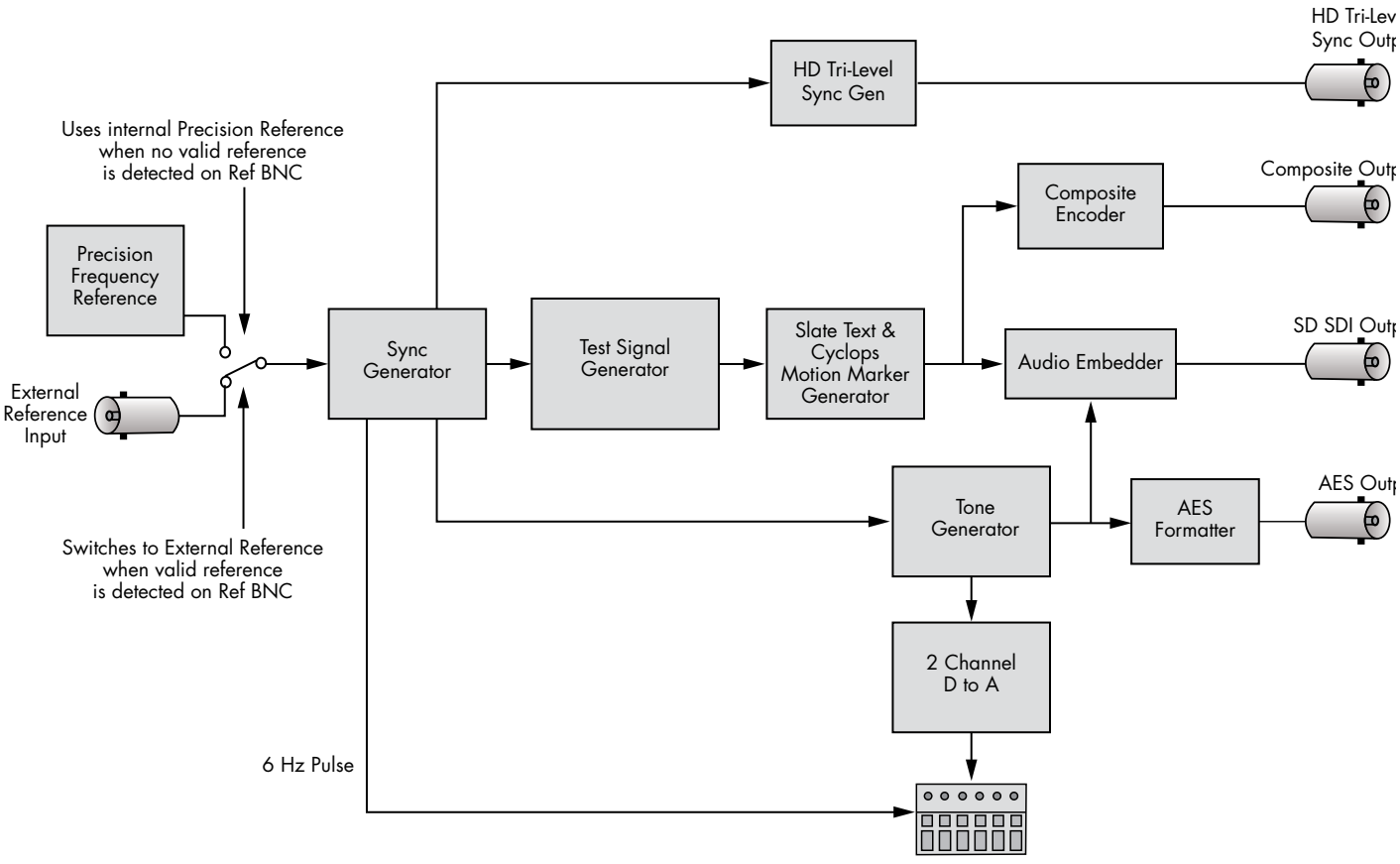
| | |
|---|---|
| Number | One |
| Type | AES3id, 1 KHz tone or silence |
| Resolution | 24 bit |

### Analog Audio Output

| | |
|---|---|
| Number | One stereo pair or two mono |
| Type | 1 KHz tone or silence |
| Impedance | 30 Ω, balanced |
| Reference Level | -10 to + 4 dBu, adjustable |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 4 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |


HD Tri-Lev Sync Outp
HD Tri-Level Sync Gen
Uses internal Precision Reference when no valid reference is detected on Ref BNC
Composite Outp
Composite Encoder
Precision Frequency Reference
SD SDI Outp
Slate Text & Cyclops Motion Marker Generator
Audio Embedder
Sync Generator
Test Signal Generator
External Reference Input
AES Outp
Tone Generator
AES Formatter
Switches to External Reference when valid reference is detected on Ref BNC
2 Channel D to A
6 Hz Pulse

# BrightEye 56

## HD / SD / Analog Test Signal and Sync Pulse Generator

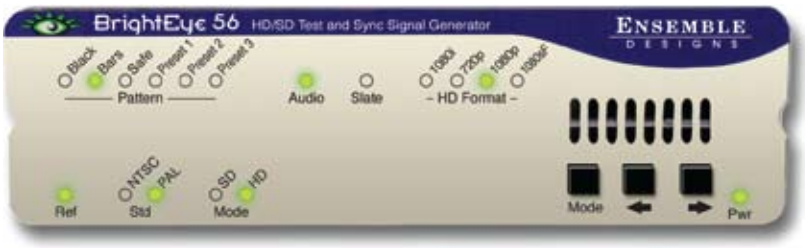
BrightEye 56 is a genlockable sync generator and test signal generator that can be used as either a slave or master reference generator. It can lock to house reference or it can lock to its own internal precision standard. BrightEye 56 is well suited for remote trucks, post, helicopters and fly packs.

HD or SD SDI test signals or black with embedded audio is output on the SDI BNCs. Composite, HD Tri-level Sync and AES digital audio outputs are also provided. There are three user Programmable Outputs that are selectable between AES, LTC, Wordclock or 6 Hz Pulse. Analog audio and AES outputs provide tone or silence.

Color Black, Bars, Crosshatch, Multi-burst, and SDI Checkfield (Pathogenic) are just some of the signals simultaneously available on the SDI and analog composite outputs. The Cyclops feature adds a motion element to the selected video test signal. An ID slate with user programmable text can overlay the test pattern.

The internal Time Code Generator feeds DVITC on the SDI outputs and VITC on the composite outputs, Time Code can also be selected in LTC form on the programmable Aux outputs.

Many controls can be adjusted through the intuitive front panel. BrightEye Mac and BrightEye PC software provide a complete user interface for all adjustments and controls.



- Master or Slave Reference Generator for All Video and Audio Gear
- Sync Pulse Generator
- 30+ HD and SD Test Signals
- Composite, SD SDI, HD Tri-Level Outputs
- Time Code Generator
- Generates Closed Caption Test Signal to Assist with CC Compliance
- Analog, AES and Embedded Audio Outputs

## Specifications

### Reference Input

| | |
|---|---|
| Number | One |
| Signal Type | 1V P-P PAL, NTSC, or 10 MHz |
| Return Loss | >40 dB DC to 5.5 MHz |

### Composite Output

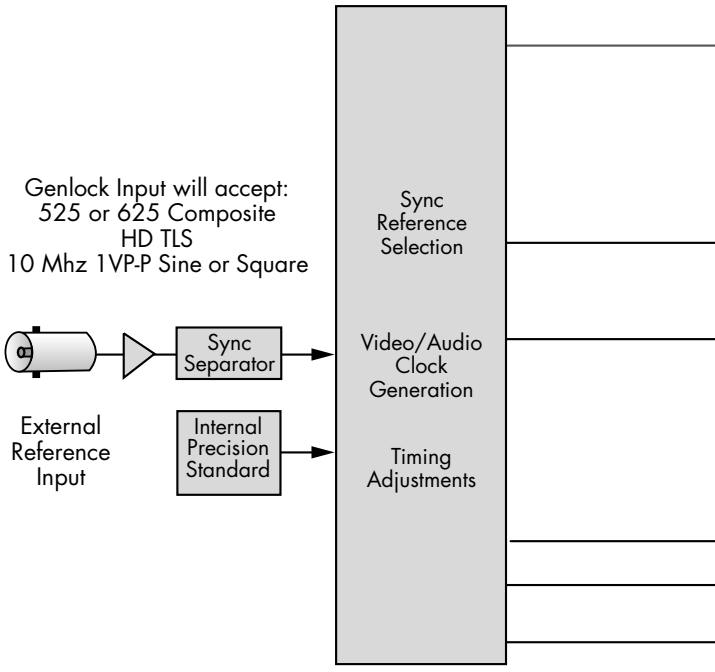
| | |
|---|---|
| Number | Two |
| Signal Type | NTSC / PAL |
| Impedance | 75 Ω |
| Return Loss | >40 dB DC to 5.5 MHz |
| Frequency Response | -0.1 dB 10 KHz to 5.0 MHz |
| Output DC | ±50 mV |
| K Factor | <1.0% |
| Differential Phase | <1.0 degree |
| SCH Phase | ±5 degrees |

### Accuracy and Timing Stability

| | |
|---|---|
| Internal | TCXO |
| PAL Fsc | 4.43361875 MHz +/- 1 Hz |
| NTSC Fsc | 3.579545 MHz +/- 1 Hz |
| 601 Fs | 27.000000 MHz +/- 5 Hz |
| Long Term Drift | <1 ppm/year |
| Analog Jitter | <1 ns |
| Digital Jitter | <0.2 UI (0.13 UI typical) |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M)<br>1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M) |
| Return Loss | >15 dB for 270 Mb/s<br>>15 dB for 1.485 Gb/s |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s<br>70 meters for 2.97 Gb/s<br>(Belden 1694A) |



### Tri-Level Sync Output

| | |
|---|---|
| Number | Two, 75 Ω |
| Output | DC ±50 mV |
| Return Loss | >30 dB to 30 MHz |

Standards Supported:
- 1080i (SMPTE 274M -4, 5, 6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1, 2, 3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9, 10, 11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14, 15, 16) 23.98, 24, 25 Hz
- 625i 50, 525i 59.94, Composite PAL, NTSC

### AES Audio Output

| | |
|---|---|
| Number | One |
| Type | AES3id, 1 KHz tone or silence |
| Resolution | 24 bit |

### Analog Audio Output

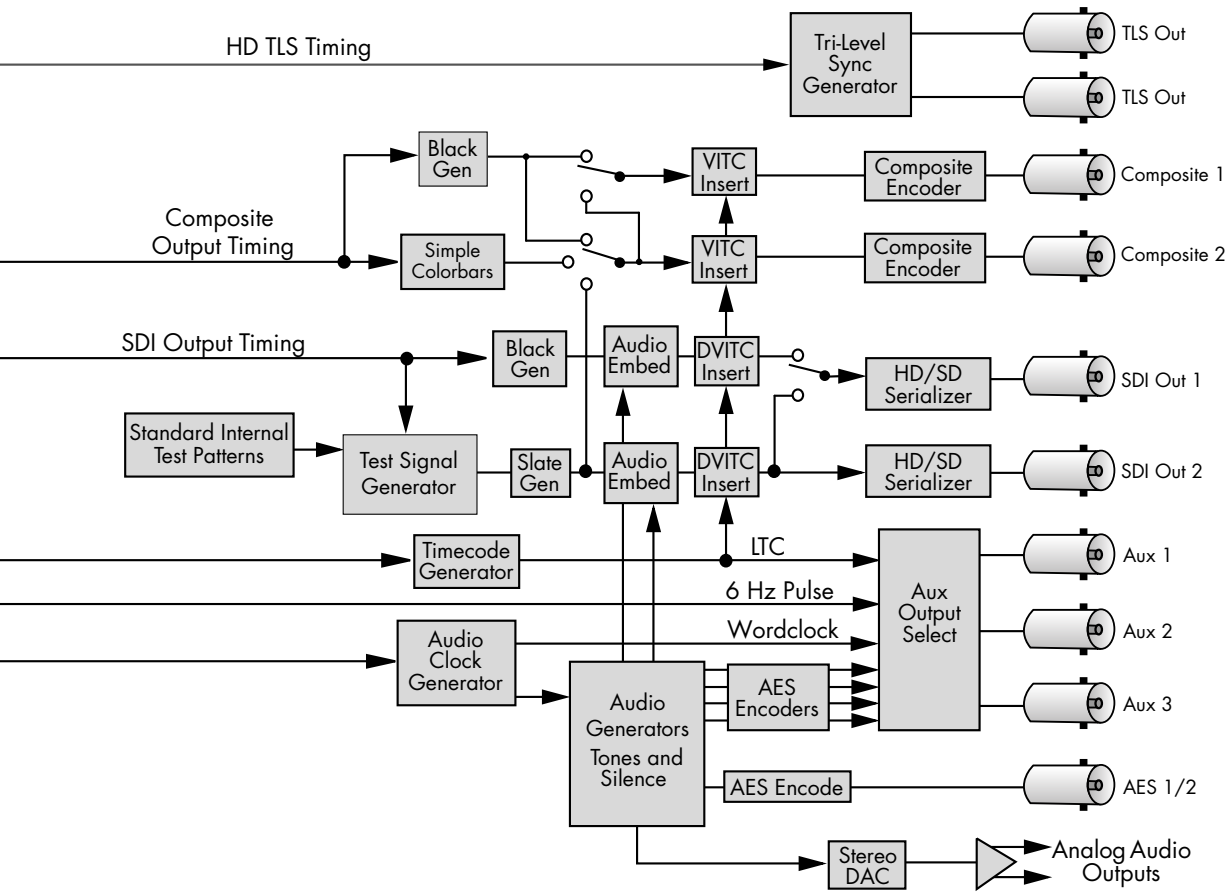
| | |
|---|---|
| Number | One stereo pair or two mono |
| Type | 1 KHz tone or silence |
| Impedance | 30 Ω, balanced |
| Reference Level | -10 to + 4 dBu, adjustable |

### Programmable Outputs

| | |
|---|---|
| Number | Three |
| Type | Selectable between AES, LTC, VITC, Wordclock or 6 Hz Pulse |
| Impedance | 75 Ω |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 12 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 57

## 3G / HD / SD / Analog Test Signal and Sync Pulse Generator

BrightEye 57 is a genlockable sync generator and test signal generator that can be used as either a slave or master reference generator. It can lock to house reference or it can lock to its own internal precision standard. BrightEye 57 is well suited for remote trucks, post, helicopters and fly packs.

1.5 Gb/s HD, 3 Gb/s HD or SD SDI test signals or black with embedded audio is output on the SDI BNCs. 3G Level A and Level B are supported. Composite, HD Tri-level Sync and AES digital audio outputs are also provided. There are three user Programmable Outputs that are selectable between AES, LTC, Wordclock or 6 Hz Pulse. Analog audio and AES outputs provide tone or silence.

Color Black, Bars, Crosshatch, Multi-burst, and SDI Checkfield (Pathogenic) are just some of the signals simultaneously available on the SDI and analog composite outputs. The Cyclops feature adds a motion element to the selected video test signal. An ID slate with user programmable text can overlay the test pattern.

The internal Time Code Generator feeds DVITC on the SD SDI outputs and VITC on the composite outputs, Time Code can also be selected in LTC form on the programmable Aux outputs.

In addition to the standard suite of test patterns, users can create custom test patterns on a computer. Simply transfer test patterns to the included Secure Digital flash memory card and then insert the memory card into the front of the BrightEye 57. Test patterns can include motion and an associated audio clip such as voice over or station ID.

Many controls can be adjusted through the intuitive front panel. BrightEye Mac and PC software provide a complete user interface for all adjustments and controls.

For facilities and manufacturers using 3 Gb/s video, BrightEye units can be combined to form a complete 3G signal chain. The BrightEye 57 test signal generator's 3G output can be distributed through the BrightEye 43 3G distribution amplifier or the BrightEye 46 and BrightEye 48 E/O 3G fiber optical transmitter/receiver set.

- Master or Slave Reference Generator for All Video and Audio Gear
- Composite, HD SDI, SD SDI, Tri-Level Outputs
- 3 Gb/s HD, Level A and Level B supported
- 30+ HD and SD Test Signals
- Create your own test patterns, transfer via Secure Digital flash memory
- Generates Closed Caption Test Signal to Assist with CC Compliance
- Sync Pulse Generator
- Time Code Generator
- Analog, AES and Embedded Audio Outputs

## Specifications

### Reference Input

| | |
|---|---|
| Number | One |
| Signal Type | 1V P-P PAL, NTSC, 10 MHz or HD Tri-Level Sync |
| Return Loss | >40 dB DC to 5.5 MHz |

### Composite Output

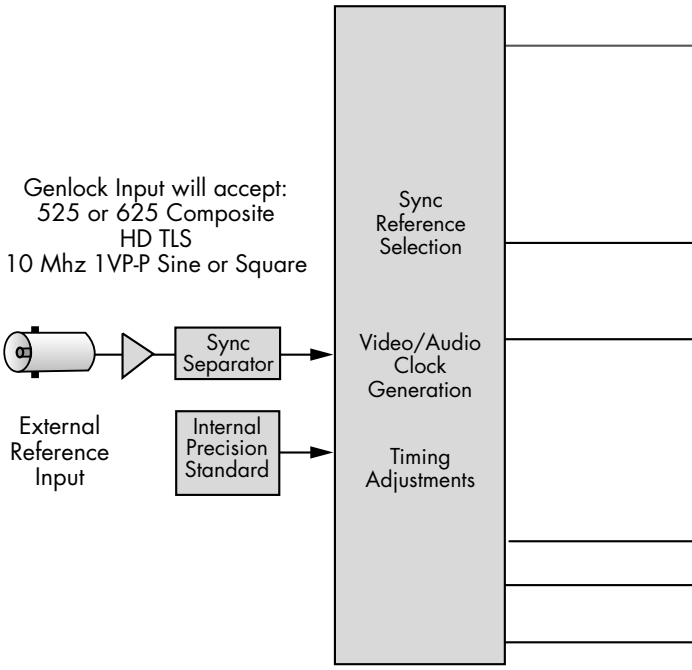
| | |
|---|---|
| Number | Two |
| Signal Type | NTSC / PAL |
| Impedance | 75 Ω |
| Return Loss | >40 dB DC to 5.5 MHz |
| Frequency Response | -0.1 dB 10 KHz to 5.0 MHz |
| Output DC | ±50 mV |
| K Factor | <1.0% |
| Differential Phase | <1.0 degree |
| SCH Phase | ±5 degrees |

### Accuracy and Timing Stability

| | |
|---|---|
| Internal TCXO | |
| PAL Fsc | 4.43361875 MHz +/- 1 Hz |
| NTSC Fsc | 3.579545 MHz +/- 1 Hz |
| 601 Fs | 27.000000 MHz +/- 5 Hz |
| Long Term Drift | <1 ppm/year |
| Analog Jitter | <1 ns |
| Digital Jitter | <0.2 UI (0.13 UI typical) |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M)<br>1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M)<br>2.97 Gb/s HD Serial Digital (SMPTE 424M, 425M) |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s<br>70 meters for 2.97 Gb/s<br>(Belden 1694A) |



### Tri-Level Sync Output

| | |
|---|---|
| Number | Two, 75 Ω |
| Output DC | ±50 mV |
| Return Loss | >30 dB to 30 MHz |

Standards Supported:
- 1080i (SMPTE 274M -4, 5, 6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1, 2, 3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9, 10, 11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14, 15, 16) 23.98, 24, 25 Hz
- 3 Gb/s Level A or Level B (SMPTE 424M, 425M)
- 625i 50, 525i 59.94, Composite PAL, NTSC

### AES Audio Output

| | |
|---|---|
| Number | One |
| Type | AES3id, 1 KHz tone or silence |
| Resolution | 24 bit |

### Analog Audio Output

| | |
|---|---|
| Number | One stereo pair or two mono |
| Type | 1 KHz tone or silence |
| Impedance | 30 Ω, balanced |
| Reference Level | -10 to + 4 dBu, adjustable |

### Programmable Outputs

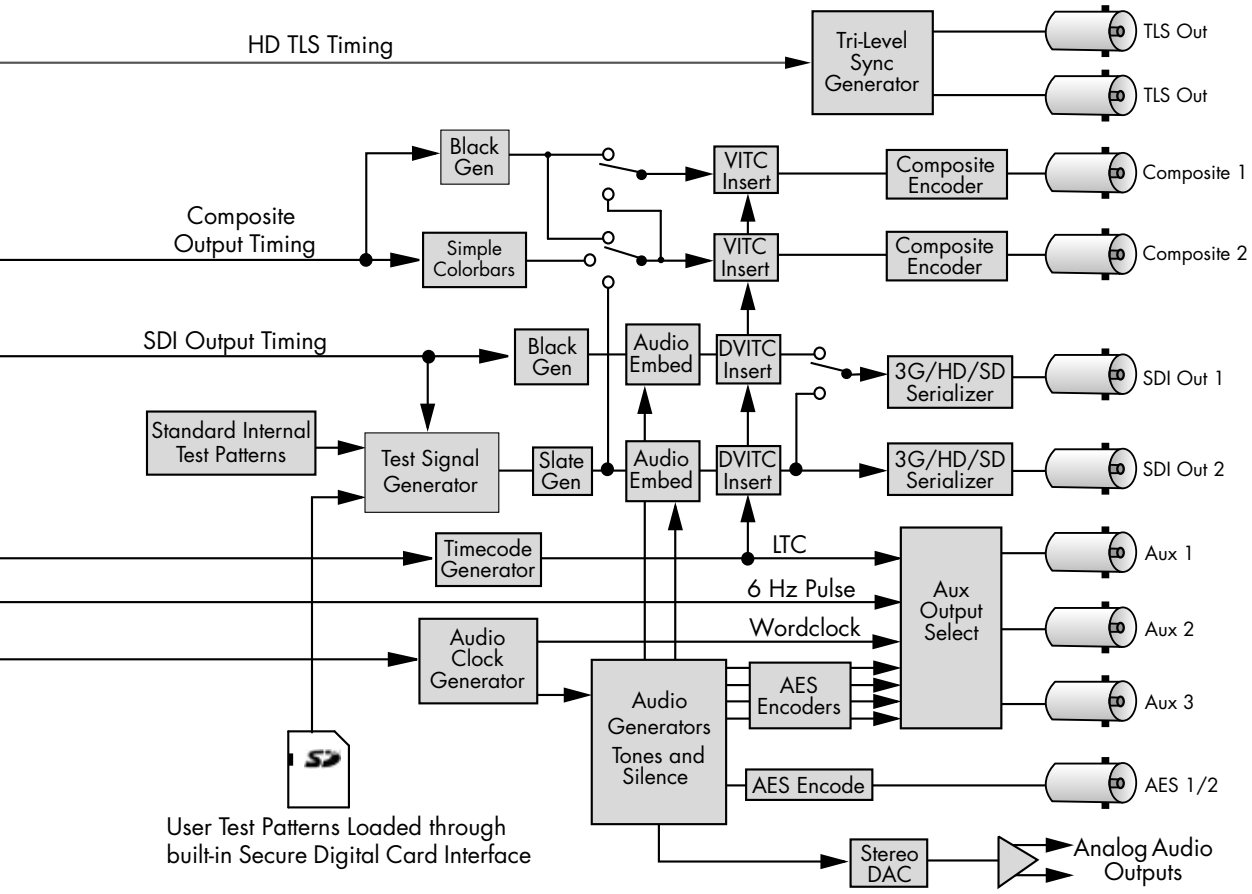
| | |
|---|---|
| Number | Three |
| Type | Selectable between AES, LTC, VITC, Wordclock or 6 Hz Pulse |
| Impedance | 75 Ω |

### Flash Memory

| | |
|---|---|
| Number | One |
| Type | Secure Digital SD Flash Memory Card |
| Size | 1 MB card included |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 12 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 70

## HD/SD AES Embedder / Disembedder

The BrightEye 70 is a dual rate eight channel audio embedder or disembedder for 1.5 Gb/s high definition video signals or for 270 Mb/s standard definition signals. Four AES ports automatically configure as inputs or outputs depending if the module is configured as mux or demux.

When configured as a multiplexer, the BrightEye 70 has one serial digital video input and four AES audio inputs. These four AES streams are embedded into the video stream. AES inputs are sample rate converted, allowing the use of asynchronous audio. The output of the module is a digital stream that contains the original video signal and four AES pairs.

When configured as a demultiplexer, audio signals present in the incoming video signal are extracted and delivered as standard AES digital audio streams.

The BrightEye 70 includes an eight channel audio mixer with channel swap and shuffle capability that allows you to completely re-arrange and re-mix audio channels. It provides precise control over audio level, with up to 12 dB of gain to compensate for low level sources. All audio processing is performed at full 24 bit resolution by a digital signal processor (DSP). Delay is adjustable up to one second. The Data mode operation allows embedding or disembedding of Dolby E or AC3 signals.

- Use with Servers, Workstations and Satellite Receivers
- HD/SD Audio Embedder or Disembedder
- 8 Channel Audio Mixing
- Adjustable Delay
- Data Mode for Dolby E and AC3

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Type | HD Serial Digital 1.485 Gb/s<br>SMPTE 274M, 292M or 296M<br>or SD Serial Digital<br>270 Mb/s SMPTE 259M-C |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD<br>300 meters for SD<br>(Belden 1694A) |

HD Standards Supported:
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Type | Follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### AES/EBU Digital Inputs

| | |
|---|---|
| Number | Four (total of eight channels) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 100 KHz (sample rate converted internally to 48 KHz) |
| Crosstalk | <144 dB |
| Dynamic Range | >144 dB |
| Reference Level | -18 or -20 dBFS (selectable) |
| | AC-3, Dolby-E<br>Supported when inputs are synchronous |

### Embedded Inputs

| | |
|---|---|
| Number | Four AES Streams<br>(from video input)<br>Eight channels from any two of four groups |
| Channels | Eight |
| Bit Depth | 20 and 24 Bit |

### AES/EBU Digital Outputs

| | |
|---|---|
| Number | Four (total of 8 channels) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 24 Bit |
| Sample Rate | 48 KHz<br>Synchronous to Video output |
| Reference Level | -18 or -20 dBFS (selectable) |

### Embedded Output (In SDI Outputs)

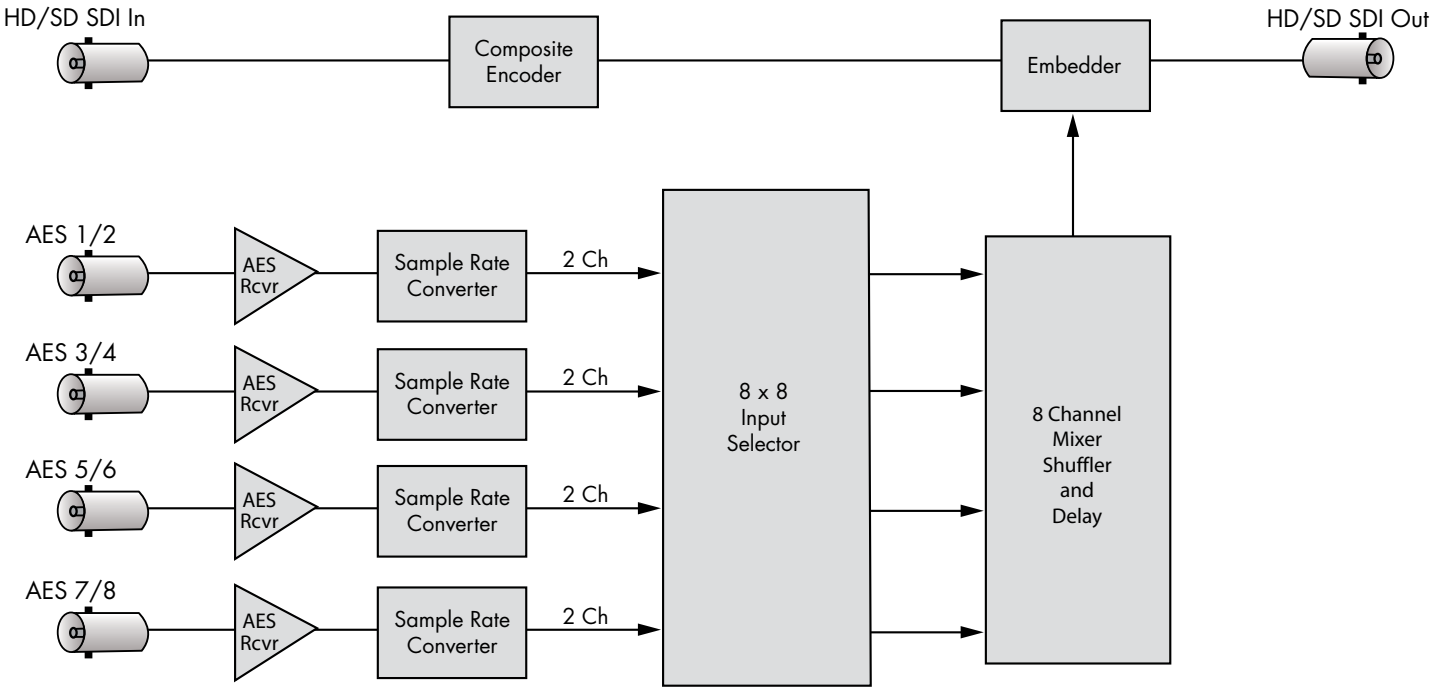
| | |
|---|---|
| Group Assign | Cascade, or Replace any two of four groups |
| Channels | Eight |
| Bit Depth | 24 Bit |

### General Specifications

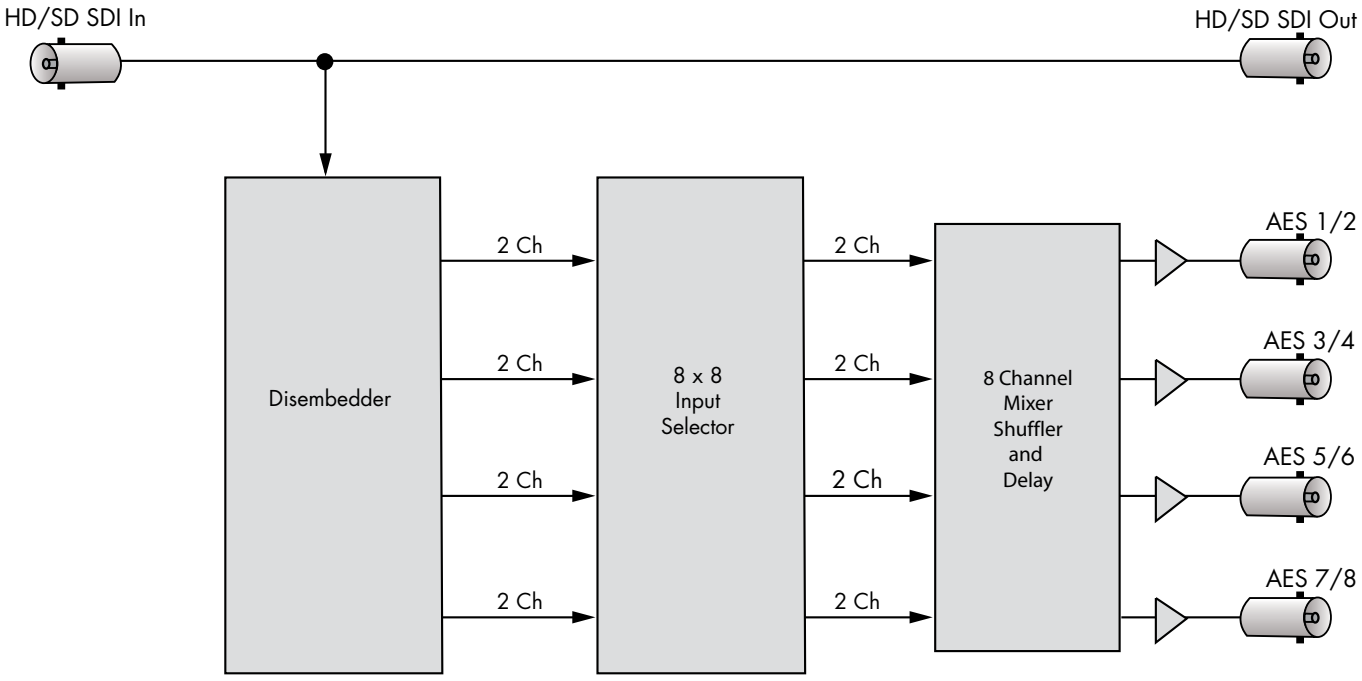
| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D<br>(143 mm x 20 mm x 140 mm)<br>including connectors |
| Power | 12 volts, 3 watts<br>(100-230 VAC modular power supply not included) |
| Power Consumption | 12 volts, 8 watts |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95% non-condensing |
| Altitude | 0 to 10,000 ft. |

BrightEye 70 Block Diagrams on following pages

## Mux Mode


HD/SD SDI In
Composite Encoder
Embedder
HD/SD SDI Out
AES 1/2
AES 3/4
AES 5/6
AES 7/8
AES Rcvr
Sample Rate Converter
2 Ch
8 x 8 Input Selector
8 Channel Mixer Shuffler and Delay

## Demux Mode


HD/SD SDI In
HD/SD SDI Out
Disembedder
2 Ch
2 Ch
2 Ch
2 Ch
8 x 8
Input
Selector
2 Ch
2 Ch
2 Ch
2 Ch
8 Channel
Mixer
Shuffler
and
Delay
AES 1/2
AES 3/4
AES 5/6
AES 7/8

# BrightEye 71

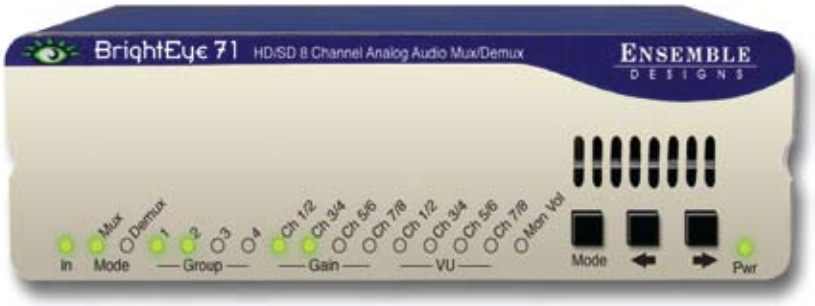
## HD / SD 8 Channel Analog Audio Embedder / Disembedder

The BrightEye 71 is a dual rate eight channel analog audio embedder or disembedder for 1.5 Gb/s high definition video signals or for 270 Mb/s standard definition signals. The analog audio ports automatically configure as inputs or outputs depending if the module is configured as mux or demux.

When configured as a multiplexer, the BrightEye 71 has one serial digital video input and eight analog audio inputs. The audio streams are embedded into the video stream. The output of the module is a digital stream that contains the original video and audio signals.

When configured as a demultiplexer, audio signals present in the incoming video signal are extracted and delivered as analog audio.

The BrightEye 71 includes an eight channel audio mixer with channel swap and shuffle capability that allows you to completely re-arrange and re-mix audio channels. It provides precise control over audio level, with up to 12 dB of gain to compensate for low level sources. All audio processing is performed at full 24 bit resolution by a digital signal processor (DSP). Delay is adjustable up to one second.



- Use with Servers, Workstations and Satellite Receivers
- HD/SD Audio Embedder or Disembedder
- 8 Channel Audio Mixing
- Adjustable Delay

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Type | HD Serial Digital 1.485 Gb/s<br>SMPTE 274M, 292M or 296M<br>or SD Serial Digital<br>270 Mb/s SMPTE 259M-C |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD<br>300 meters for SD<br>(Belden 1694A) |

Automatic Input Cable Equalization

HD Standards Supported:
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Type | Follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### Analog Audio Inputs

| | |
|---|---|
| Number | Eight<br>(selectable as inputs or outputs) |
| Type | Balanced |
| Impedance | >15K Ω |
| Maximum Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Analog Audio Outputs

| | |
|---|---|
| Number | Eight<br>(selectable as inputs or outputs) |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |
| Resolution | 24 bits, 128 x oversampled |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ± 0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Embedded Output (In SDI Outputs)

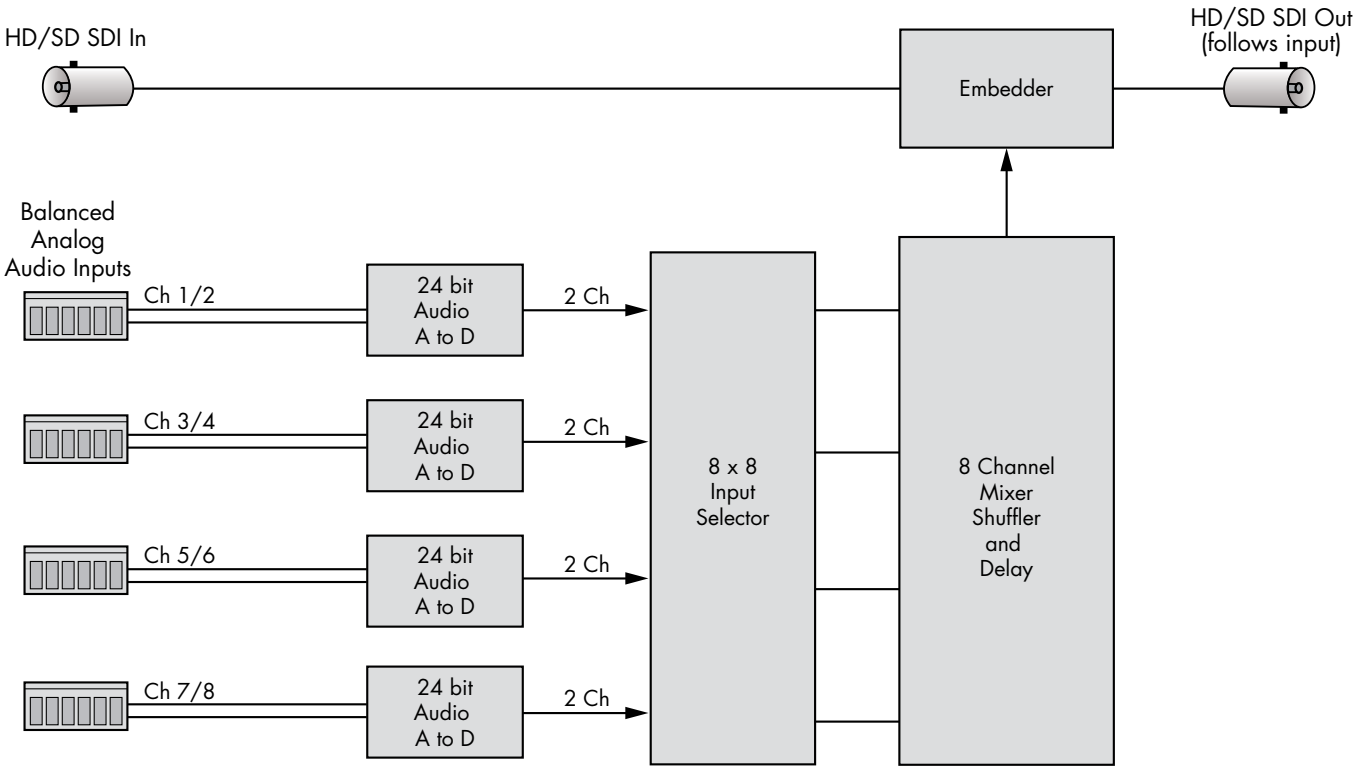
| | |
|---|---|
| Group Assign | Cascade, or Replace any<br>two of four groups |
| Channels | Eight |
| Bit Depth | 24 Bit |

### General Specifications

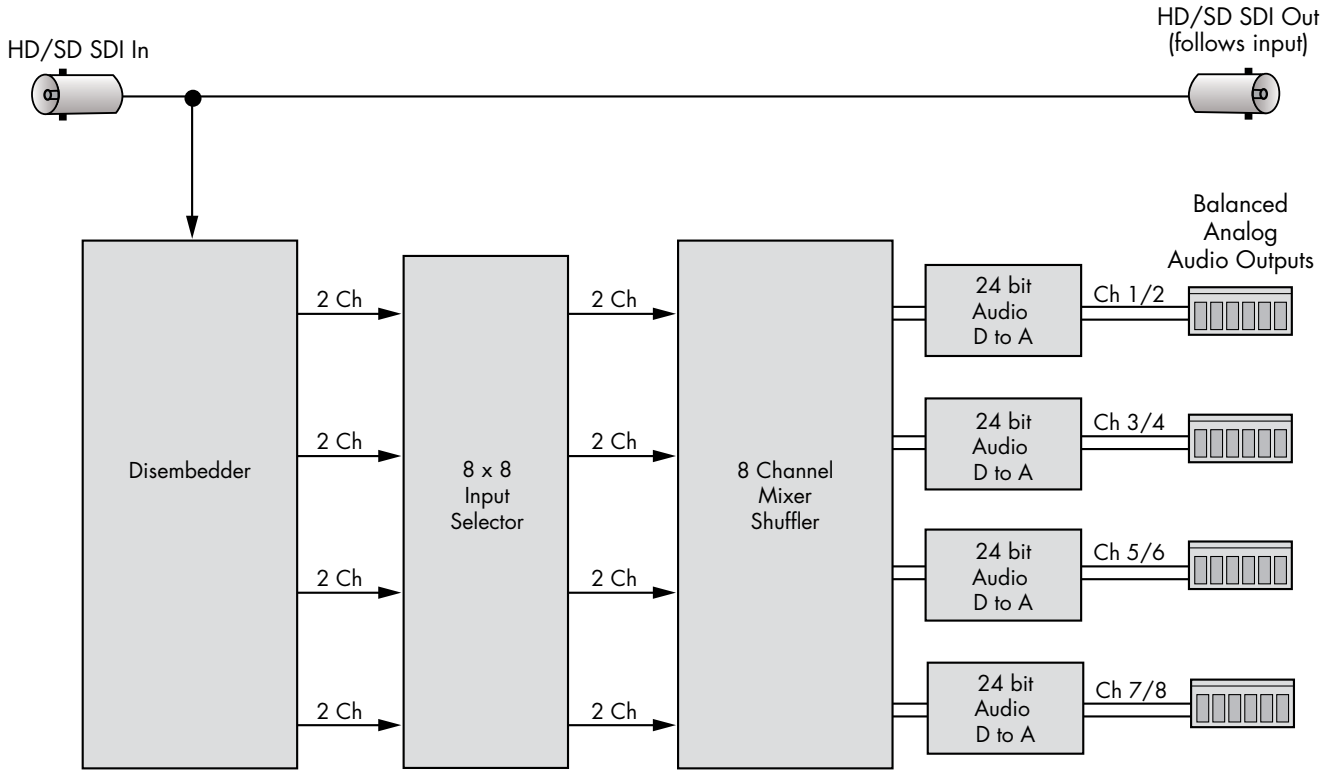
| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D<br>(143 mm x 20 mm x 140 mm)<br>including connectors |
| Power | 12 volts, 8 watts<br>(100-230 VAC modular power<br>supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95% non-condensing |
| Altitude | 0 to 10,000 ft. |

BrightEye 71 Block Diagrams on following pages

## Mux Mode


HD/SD SDI In
Embedder
HD/SD SDI Out
(follows input)
Balanced
Analog
Audio Inputs
Ch 1/2
Ch 3/4
Ch 5/6
Ch 7/8
24 bit
Audio
A to D
2 Ch
8 x 8
Input
Selector
8 Channel
Mixer
Shuffler
and
Delay

## Demux Mode


HD/SD SDI In
HD/SD SDI Out
(follows input)
Balanced
Analog
Audio Outputs
Disembedder
2 Ch
2 Ch
2 Ch
2 Ch
8 x 8
Input
Selector
2 Ch
2 Ch
2 Ch
2 Ch
8 Channel
Mixer
Shuffler
24 bit
Audio
D to A
24 bit
Audio
D to A
24 bit
Audio
D to A
24 bit
Audio
D to A
Ch 1/2
Ch 3/4
Ch 5/6
Ch 7/8

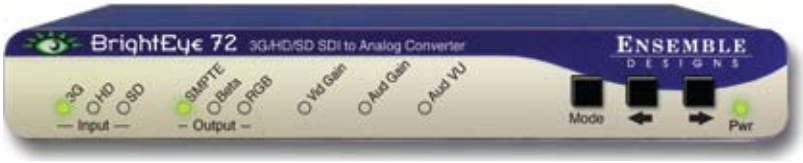
# BrightEye 72

## 3G / HD / SD SDI to Analog Component Converter and HDMI

BrightEye 72 provides HD or SD SDI digital to analog video conversion with the full range of analog output formats available for SD, 1.5 Gb/s HD and 3 Gb/s HD. When an HD input is present HD RGB or YPrPb are output. When an SD input is present Beta, SMPTE, RGB or composite with simultaneous Y/C is output. With HDMI and analog audio outputs, BrightEye 72 is a complete monitoring solution for all of your digital sources. 12 bit processing ensures the best looking images.

Output format and gain are controlled from the front panel. A status display indicates input presence. Levels and audio delay can be adjusted through BrightEye Mac or PC software.

For facilities using 3G the issue of monitoring the signal becomes a challenge. The BrightEye 72 is a 3G/HD/SD/SDI digital to analog video converter with an HDMI confidence monitor out that provides a convenient way to monitor any type of digital video signal. A 3G video signal can be easily viewed via the HDMI output.



- Use with HD or SD Monitors, VTRs and Projectors
- Use in the Field for Confidence Monitoring
- Use in Post with 4:4:4 Material
- Use with HD or SD SDI signals
- 3G HD, Level A or Level B supported
- Analog Component Outputs
- Audio Delay Adjustment
- HDMI Outputs - monitor any digital feed, even 3G
- Analog Audio Outputs

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Type | 1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M)<br>2.97 Gb/s HD Serial Digital (SMPTE 424M, 425M)<br>SD Serial Digital (270 Mb/s SMPTE 259M-C) |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s<br>70 meters for 2.97 Gb/s (Belden 1694A) |

Automatic Input Cable Equalization

HD Standards Supported:
- 1080i (SMPTE 274M -4, 5, 6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1, 2, 3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9, 10, 11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14, 15, 16) 23.98, 24, 25 Hz
- 3 Gb/s Level A or Level B (SMPTE 424M, 425M)

### Analog Output

HD input yields HD analog out,
SD input yields SD analog out

| | |
|---|---|
| Number | One |
| Type | Analog component Beta/SMPTE, Y, Pr, Pb<br>RGB |
| Return Loss | >35 dB 0 to 10 MHz<br>>20 dB 10 to 30 MHz |
| Output DC | None (AC coupled) |

### Serial Digital Output

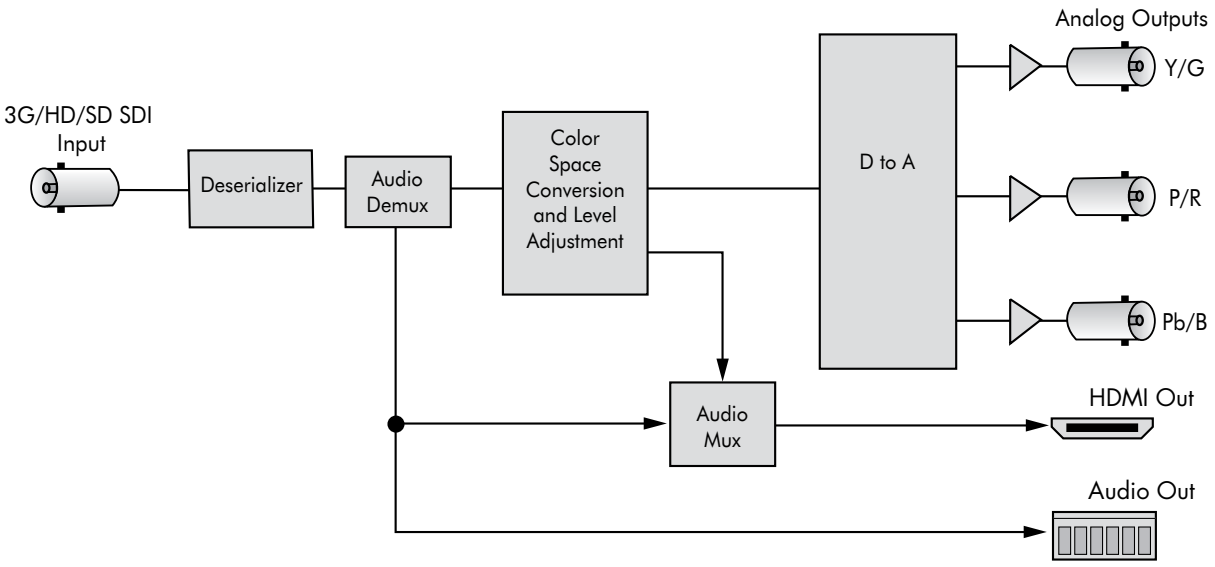
| | |
|---|---|
| Number | One |
| Type | Follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s<br>70 meters for 2.97 Gb/s (Belden 1694A) |

### SDI to Analog Performance

| | |
|---|---|
| Bit Resolution | 10 bit output reconstruction |
| Signal to Noise | >65 dB |
| Frequency Response | ±0.1 dB, 0 to 10 MHz<br>±0.5 dB, 10 to 30 MHz |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 9 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



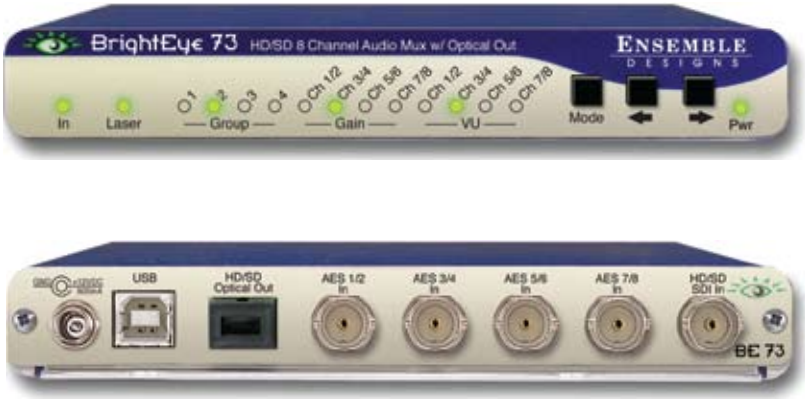
# BrightEye 73

## HD / SD AES Embedder with Optical Out

The BrightEye 73 is a dual rate eight channel audio embedder for 1.5 Gb/s high definition video signals or for 270 Mb/s standard definition signals.

There is one serial digital video input and four AES audio inputs. These four AES streams are embedded into the video stream. AES inputs are sample rate converted, allowing the use of asynchronous audio. The output of the module is an optical signal that contains the original video signal and four AES pairs.

The BrightEye 73 includes an eight channel audio mixer with channel swap and shuffle capability that allows you to completely re-arrange and re-mix audio channels. It provides precise control over audio level, with up to 12 dB of gain to compensate for low level sources. All audio processing is performed at full 24 bit resolution by a digital signal processor (DSP). Delay is adjustable up to one second. The Data mode operation allows Dolby E or AC3 inputs.




- Optical Transmitter
- Use with Servers, Workstations and Routers
- 8 Channel Audio Embedder
- Adjustable Delay
- HD/SD SDI Electrical and AES Inputs
- Optical Embedded Output

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Type | HD Serial Digital 1.485 Gb/s SMPTE 274M, 292M or 296M<br>or SD Serial Digital 270 Mb/s SMPTE 259M-C |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters (Belden 1694A) |

Automatic Input Cable Equalization

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### AES/EBU Digital Inputs

| | |
|---|---|
| Number | Four (total of eight channels) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 100 KHz (sample rate converted internally to 48 KHz) |
| Crosstalk | <144 dB |
| Dynamic Range | >144 dB |
| Reference Level | -18 or -20 dBFS (selectable) |
| | AC-3, Dolby-E |
| | Supported when inputs are synchronous |

### Optical Output

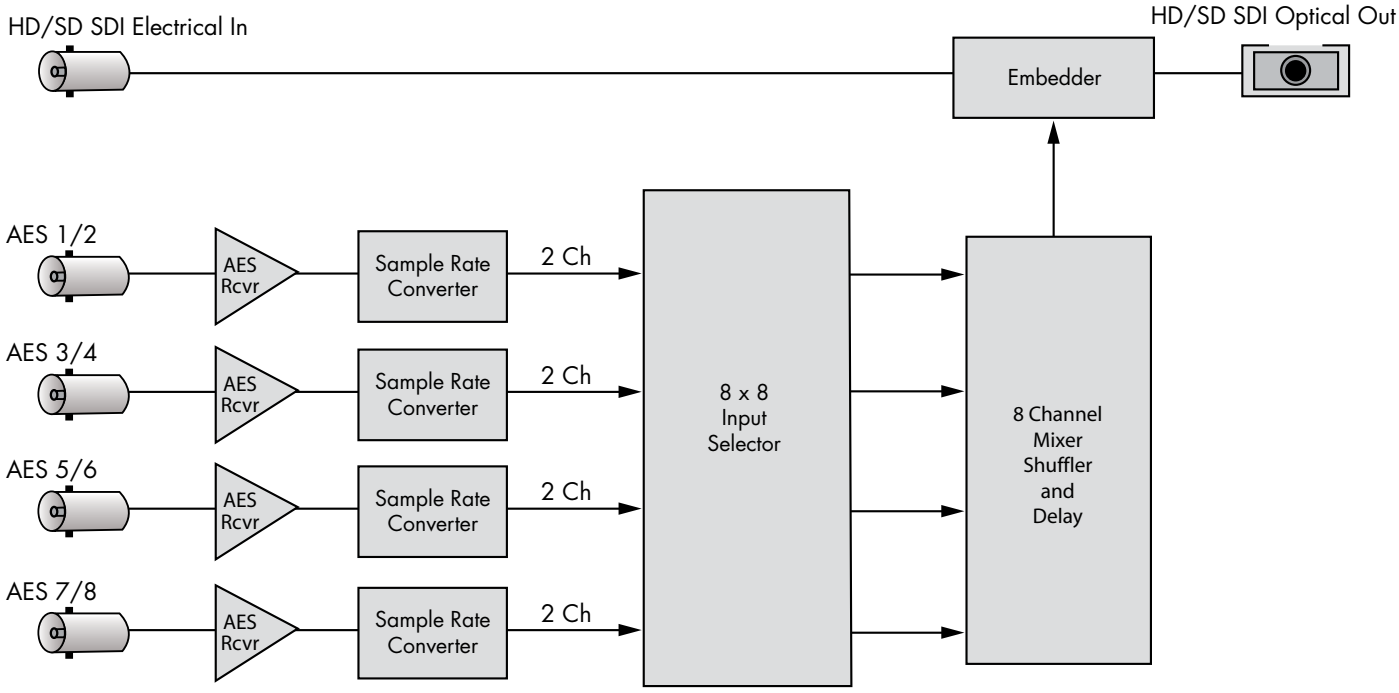
| | |
|---|---|
| Number | One |
| Type | SD and ASI (SMPTE 297M, optical equivalent of 259M)<br>HD (SMPTE 274M or 296M) |
| Wavelength | 1310 nm (1550 by special order) |
| Power | -7 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | SC |

### Embedded Output (In Optical Outputs)

| | |
|---|---|
| Group Assign | Cascade, or Replace any two of four groups |
| Channels | Eight |
| Bit Depth | 24 Bit |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 3 watts<br>(100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 74

## Optical Disembedder with HD / SD Electrical Out

The BrightEye 74 is an eight channel audio disembedder for 1.5 Gb/s high definition video signals or for 270 Mb/s standard definition signals.

The BrightEye 74 accepts either an HD or SD optical signal. The digital video output is present on a BNC and is either HD SDI or SD SDI, following the input standard. Audio signals present in the incoming video signal are extracted and delivered as standard AES digital audio streams.

The BrightEye 74 includes an eight channel audio mixer with channel swap and shuffle capability that allows you to completely re-arrange and re-mix audio channels. It provides precise control over audio level, with up to 12 dB of gain to compensate for low level sources. All audio processing is performed at full 24 bit resolution by a digital signal processor (DSP). Delay is adjustable up to one second. The data mode allows disembedding of Dolby E or AC3 signals.

- Optical Receiver
- Use with satellite receivers and video servers
- HD/SD Audio Disembedder
- 8 Channel Audio Mixing
- Adjustable Delay

## Specifications

### Optical Input

| | |
|---|---|
| Number | One |
| Type | SD and ASI (SMPTE 297M, optical equivalent of 259M)<br>HD (SMPTE 274M, 292M or 296M) |
| Wavelength | 830 to 1550 nm |
| Receiver Sensitivity | SD and ASI: -18 dBm<br>HD: -18 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | SC |

### Embedded Inputs

| | |
|---|---|
| Number | Four AES Streams (from optical input)<br>Eight channels from any two of four groups |
| Channels | Eight |
| Bit Depth | 20 and 24 Bit |

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Serial Digital Output

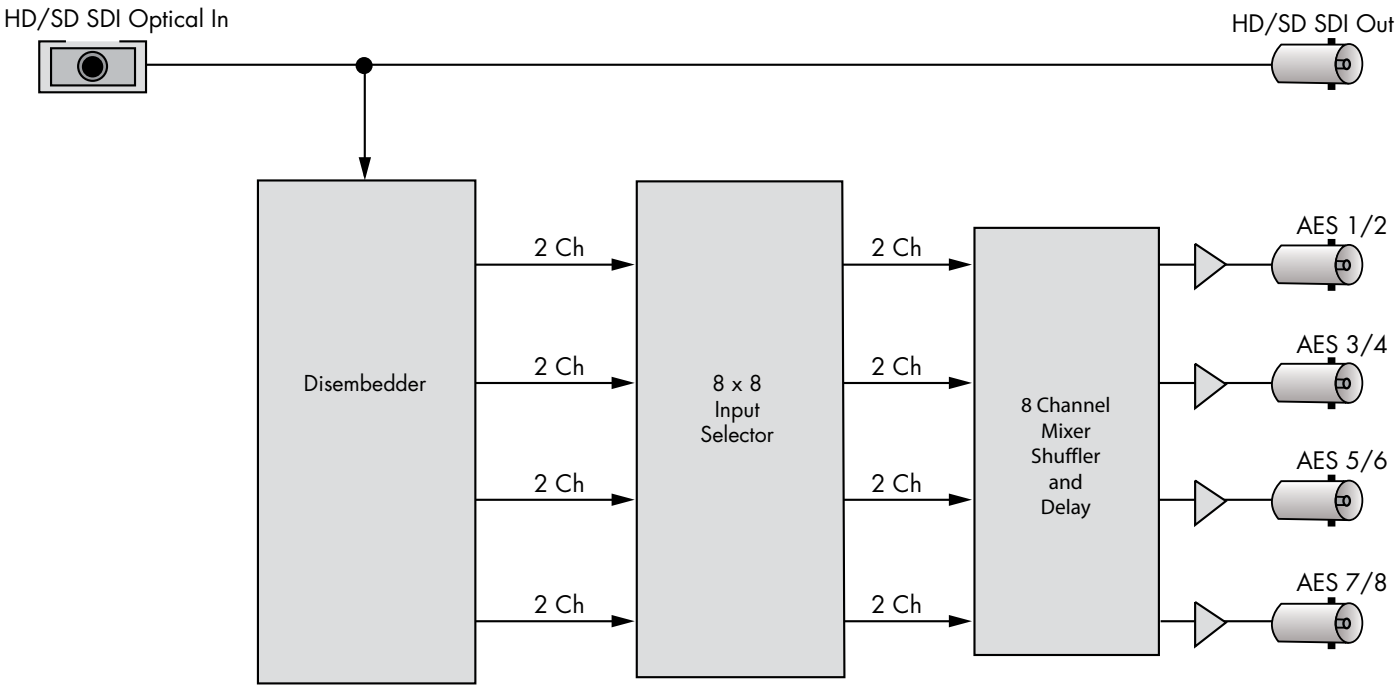
| | |
|---|---|
| Number | One |
| Type | Follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Output DC | None (AC coupled) |

### AES/EBU Digital Outputs

| | |
|---|---|
| Number | Four (total of 8 channels) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 48 KHz<br>Synchronous to Video output |
| Reference Level | -18 or -20 dBFS (selectable) |

### General Specifications

| | |
|---|---|
| Power Consumption | 12 watts, 3 watts |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95% non-condensing |
| Altitude | 0 to 10,000 ft. |




HD In Yields HD Out
SD In Yields SD Out

# BrightEye 75

## HD / SD Analog to Digital Video Converter

BrightEye 75 is an analog video to digital converter and audio embedder. Standard definition component or composite, or high definition analog component video is accepted on the input BNCs. Two channels of analog audio are input on a plugable Phoenix connector.

This unit is perfect for use with HD cameras or other devices with analog I/O. The digital output will carry the full, un-compressed input, synchronous to a genlock reference. You can turn a hand-held HD camera into a digital source. A three camera, live studio suddenly becomes affordable.

The built-in TBC/Frame Synchronizer allows you to feed asynchronous or noisy signals to the BrightEye 75. The input is digitized to 12 bits of resolution and time base corrected by a noise tolerant tracking circuit. An external reference input allows genlock to a house reference. Input selection, gain control, and TBC enable is provided through the front panel interface. Video levels can be adjusted through BrightEye Mac or PC software.

The video and audio signals are embedded and presented on a BNC. The output follows the SD or HD input standard.

- Use with Analog HD Cameras and Set Top Boxes
- Turn Analog Camera Into Digital HD Source
- HD/SD Analog Inputs
- Analog Audio Inputs
- Serial Digital HD or SD Embedded Output
- TBC and Frame Sync

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | HD or SD :Y, Pr, Pb (SMPTE or Beta levels)<br>HD or SD: Analog Component RGB (sync on green)<br>Analog Composite PAL or NTSC<br>Analog S-Video PAL or NTSC |
| Resolution | Digitized at 12 bits |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Analog Audio Inputs

| | |
|---|---|
| Number | Two |
| Type | Balanced |
| Impedance | >15K Ω |
| Max Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Type | Follows input standard<br>HD Serial Digital 1.485 Gb/s SMPTE 274M, 292M or 296M or<br>SD Serial Digital 270 Mb/s SMPTE 259M-C |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD<br>300 meters for SD (Belden 1694A) |

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Embedded Output (In Serial Output)

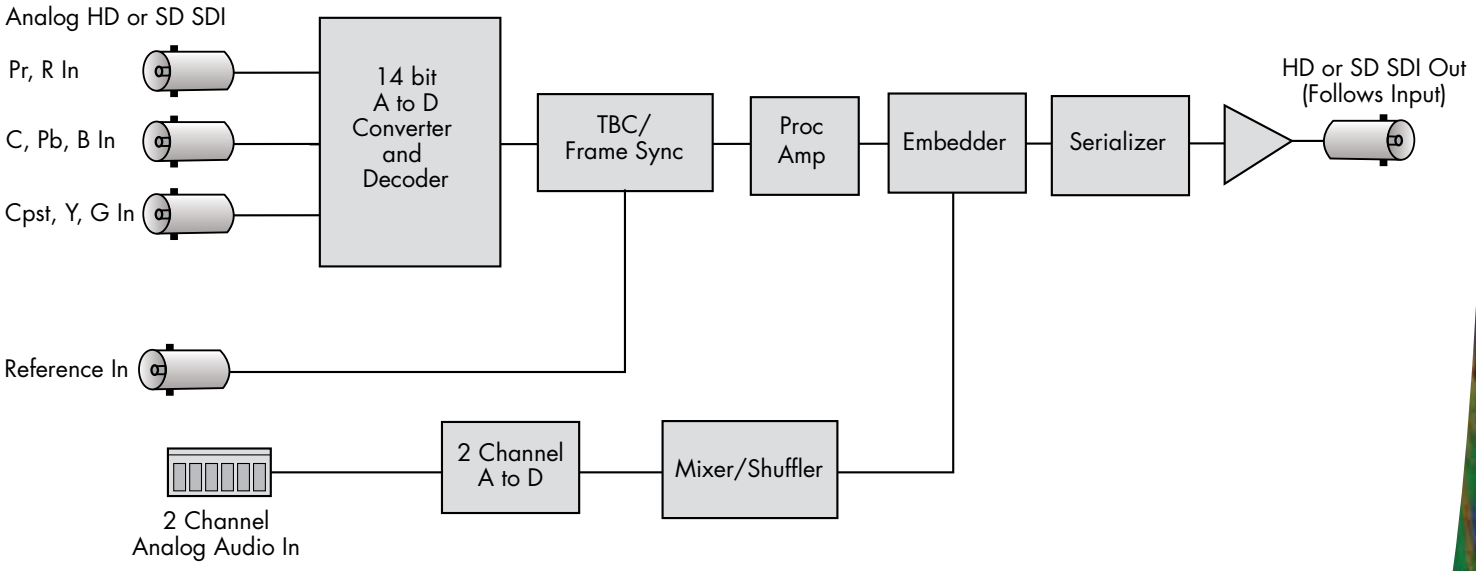
| | |
|---|---|
| Group Assign | One of four groups |
| Channels | Two |
| Bit Depth | 24 Bit |

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video, PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 6 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 76

## HD / SD Analog to Digital Video Converter with Optical Out

BrightEye 76 is an analog video to digital converter and audio embedder. Standard definition component or composite, or high definition analog component video is accepted on the input BNCs. Two channels of analog audio are input on a plugable Phoenix connector.

This unit is perfect for use with HD cameras or other devices with analog I/O. The digital output will carry the full, un-compressed input, synchronous to a genlock reference. You can turn a hand-held HD camera into a digital source. A three camera, live studio suddenly becomes affordable.

The built-in TBC/Frame Synchronizer allows you to feed asynchronous or noisy signals to the BrightEye 76. The input is digitized to 12 bits of resolution and time base corrected by a noise tolerant tracking circuit. An external reference input allows genlock to a house reference.

Input selection, gain control, and TBC enable is provided through the front panel interface. Video levels can be adjusted through BrightEye Mac or PC software.

The video and audio signals are embedded and presented as an optical output. The output follows the SD or HD input standard.

- Optical Transmitter
- Use with Analog HD Cameras and Set Top Boxes
- Turn Analog Camera Into Digital HD Source
- Analog Component HD or SD Inputs
- Analog Audio Inputs
- Optical Embedded Output
- TBC and Frame Sync

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | HD or SD :Y, Pr, Pb (SMPTE or Beta levels)<br>HD or SD: Analog Component RGB (sync on green)<br>Analog Composite PAL or NTSC<br>Analog S-Video PAL or NTSC |
| Resolution | Digitized at 12 bits |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Analog Audio Inputs

| | |
|---|---|
| Number | Two |
| Type | Balanced |
| Impedance | >15K Ω |
| Maximum Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Optical Output

| | |
|---|---|
| Number | One |
| Type | SD and ASI (SMPTE 297M, optical equivalent of 259M)<br>HD (SMPTE 274M, 292M or 296M) |
| Wavelength | 1310 nm (1550 by special order) |
| Power | -7 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | SC |

### Embedded Output (In Optical Output)

| | |
|---|---|
| Group Assign | One of four groups |
| Channels | Two |
| Bit Depth | 24 Bit |

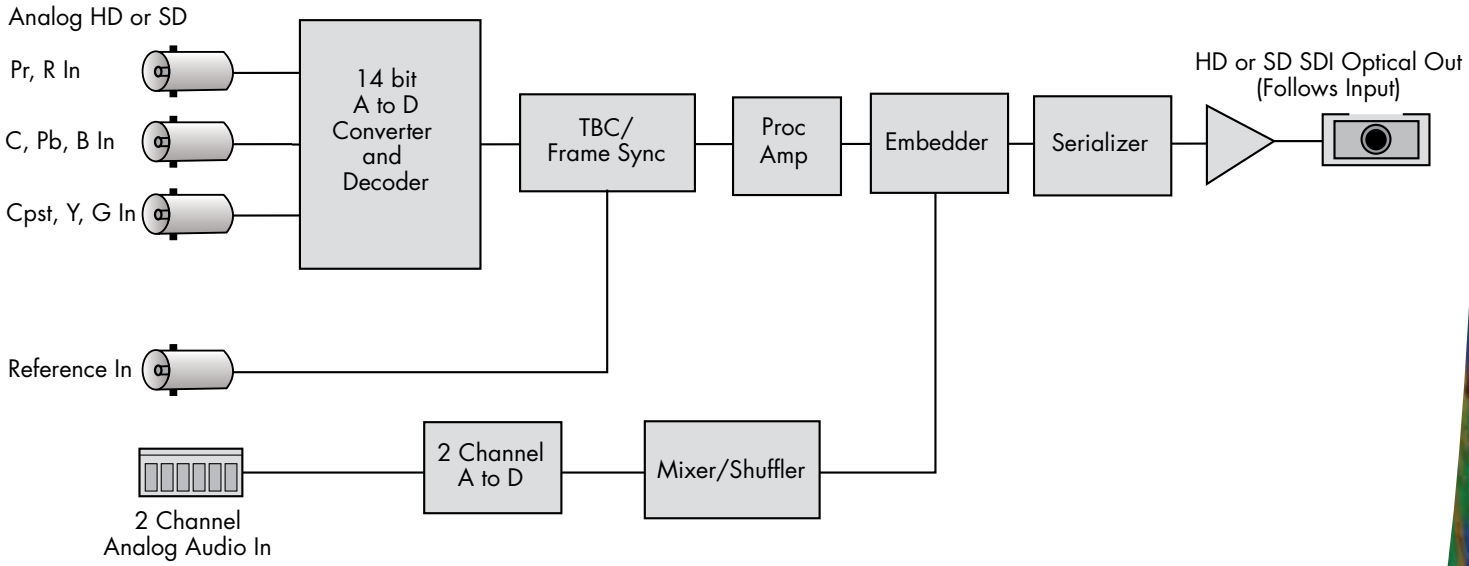
HD Standards Support:
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video, PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 6 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |




Analog SD In Yields SD SDI Out
Analog HD In Yields HD SDI Out

# BrightEye 81

## 3G / HD / SD SDI to HDMI Converter

Convert HD or SD SDI video feeds to HDMI with the BrightEye 81. Convenient for feeding a video monitor, BrightEye 81 provides a reliable way to acheive confidence monitoring in post and broadcast applications.

BrightEye 81 is an SDI to HDMI converter for use with standard definition video signals and 3 Gb/s and 1.5 Gb/s high definition signals. The HDMI output is not HDCP encrypted. The video input is also reclocked and output on a BNC connector.

For facilities using 3G the issue of monitoring the signal becomes a challenge. The BrightEye 81-F provides a convenient way to monitor any type of digital video signal. A 3G video signal can be easily viewed via the HDMI output.

BrightEye 81 also functions as a Dual Link to 3 Gb/s converter. When the input is Dual Link RGB 444 the output will be the 3G version of that data.

Signal monitoring and control is provided through the included BrightEye Mac and BrightEye PC software.

- HD and SD SDI to HDMI Converter
- Dual Link to 3G Converter
- Use with Video Monitors that have HDMI Input
- Use with HD or SD Signals
- 3G HD, Level A and Level B Supported
- Passes Embedded Audio

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | Two, BNC |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M)<br>1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M)<br>2.97 Gb/s HD Serial Digital (SMPTE 424M, 425M)<br>Dual Link HD SDI (SMPTE 372M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s<br>70 meters for 2.97 Gb/s<br>(Belden 1694A) |

Automatic Input Cable Equalization

SDI Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz
- 3 Gb/s Level A or Level B (SMPTE 424M, 425M)
- Dual Link HD SDI (SMPTE 372M)
- 525i, 625i (SMPTE 259M)

### Serial Digital Output

| | |
|---|---|
| Number | One, BNC |
| Signal Type | Follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Output DC | None (AC coupled) |

### HDMI Output

| | |
|---|---|
| Number | One |
| Type | HDMI 1.3 |
| Format | Follows input |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D<br>(143 mm x 20 mm x 140 mm)<br>including connectors |
| Power | 12 volts, 7 watts<br>(100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

# BrightEye 81-F

## Optical to HDMI and 3G / HD / SD SDI Electrical Converter

Convert optical HD or SD video feeds to HDMI and electrical with the BrightEye 81-F. Convenient for feeding a video monitor, BrightEye 81-F provides a reliable way to monitor optical feeds in broadcast and mobile applications.

BrightEye 81-F is an optical to HDMI and electrical converter for use with standard definition video signals and 3 Gb/s and 1.5 Gb/s high definition signals. The video input is received on an optical LC connector, converted, and then output on both a BNC connector and an HDMI connector. The HDMI output is not HDCP encrypted.

For facilities using 3G, the issue of monitoring the signal becomes a challenge. A 3G video signal can be easily viewed via the HDMI output.

Signal monitoring and control is provided through the included BrightEye Mac and BrightEye PC software.

- Optical to HDMI Converter
- Optical to Electrical Converter
- Use with Video Monitors that have HDMI Input
- Use with HD or SD Signals
- 3G HD, Level A and Level B Supported
- Optical Receiver
- Passes Embedded Audio

## Specifications

### Optical Input

| | |
|---|---|
| Number | One, LC/UPC |
| Type | 270 Mb/s (SMPTE 297M, optical equivalent of 259M)<br>1.485 Gb/s Gb/s HD Serial Digital (SMPTE 274M, 272M or 296M)<br>2.97 Gb/s HD Serial Digital (SMPTE 424M, 425M) |
| Wavelength | 830 to 1550 nm |
| Receiver Sensitivity | -18 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |

SDI Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz
- 3 Gb/s Level A or Level B (SMPTE 424M, 425M)
- 525i, 625i (SMPTE 259M)

### Serial Digital Output

| | |
|---|---|
| Number | One, BNC |
| Signal Type | Follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Output DC | None (AC coupled) |

### HDMI Output

| | |
|---|---|
| Number | One |
| Type | HDMI 1.3 |
| Format | Follows input |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 7 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

# BrightEye 83

## HDMI to 3G / HD / SD SDI Converter

Convert HDMI to HD or SD SDI with the BrightEye 83. Convenient for broadcast video cameras and other sources with an HDMI output, BrightEye 83 presents the serial digital video signal on two BNC outputs.

BrightEye 83 is an HDMI converter for use with standard definition video signals and 3 Gb/s and 1.5 Gb/s high definition signals.

Signal monitoring and control is provided through the included BrightEye Mac and BrightEye PC software.

In compliance with the licensing restrictions on HDCP encrypted material, BrightEye 83 cannot convert encrypted signals to SDI form.

- HDMI to HD and SD SDI Converter
- Use with cameras and other sources that have an HDMI output
- Use with HD or SD Signals
- 3G HD, Level A and Level B Supported
- Passes Embedded Audio

## Specifications

### Input

| | |
|---|---|
| Number | One |
| Type | HDMI 1.3 |
| Format | Supports HDMI signals which map to the video standards listed below |

SDI Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz
- 3 Gb/s Level A or Level B (SMPTE 424M, 425M)
- 525i, 625i (SMPTE 259M)

### Serial Digital Output

| | |
|---|---|
| Number | Two, BNC |
| Signal Type | Follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Output DC | None (AC coupled) |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 7 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

# BrightEye 83-F

## HDMI to Optical and Electrical 3G / HD / SD SDI Converter

Convert HDMI to HD or SD SDI with the BrightEye 83. Convenient for broadcast video cameras and other sources with an HDMI output, BrightEye 83 presents both electrical and optical serial digital outputs.

The optical output can drive single mode fiber to a distance of 20 kilometers. With an optical launch power attenuator, multi-mode fiber can also be used.

BrightEye 83-F is for use with standard definition video signals and 3 Gb/s and 1.5 Gb/s high definition signals.

Signal monitoring and control is provided through the included BrightEye Mac and BrightEye PC software.

In compliance with the licensing restrictions on HDCP encrypted material, BrightEye 83 cannot convert encrypted signals to SDI form.

- HDMI to HD and SD SDI Converter
- HDMI to Optical Converter
- Use with cameras and other sources that have an HDMI output
- Use with HD or SD Signals
- 3G HD, Level A and Level B Supported
- Optical Transmitter
- Passes Embedded Audio

## Specifications

### Input

| | |
|---|---|
| Number | One |
| Type | HDMI 1.3 |
| Format | Supports HDMI signals which map to the video standards listed below |

SDI Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz
- 3 Gb/s Level A or Level B (SMPTE 424M, 425M)
- 525i, 625i (SMPTE 259M)

### Serial Digital Output

| | |
|---|---|
| Number | One, BNC |
| Signal Type | Follows input |
| Impedance | 75 Ω |
| Return Loss | >15 dB to 1.485 GHz<br>>10 dB to 2.97 GHz |
| Output DC | None (AC coupled) |

### Optical Output

| | |
|---|---|
| Number | One, LC/UPC |
| Type | Follows input |
| Wavelength | 1310 nm (1550 by special order) |
| Power | -7 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8" H x 5.5" D<br>(143 mm x 20 mm x 140 mm)<br>including connectors |
| Power | 12 volts, 7 watts<br>(100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95° non-condensing |

# BrightEye 90

## HD Up / Down / Cross Converter and ARC with AES Audio

### Easy To Use

BrightEye 90 is a versatile up/down/cross converter or aspect ratio converter for use with analog and digital video signals. Simply set the BrightEye 90 to output your facility's preferred HD or SD standard. The BrightEye 90 will accommodate whatever input you connect - analog composite, SD SDI or HD SDI. After setting the output standard, BrightEye 90 automatically converts the selected input to the correct standard for your facility. BrightEye 90 will upconvert, downconvert, cross convert, or act as an ARC, as needed. A special Mirror Output Mode can be enabled, causing the output image to be flipped left to right for use with on-camera talent. The built-in Frame Synchronizer allows you to feed asynchronous signals to the BrightEye 90. An external reference input allows genlock to a house reference. All vertical interval data and closed captioning is faithfully passed.

### Upconverting to High Definition

Feed the analog composite or SD SDI output of a camera to a BrightEye 90 and upconvert to HD. You can take the HD signal from the BrightEye 90 into a switcher or projection system. Upconverting existing SD equipment lets you leverage the equipment you already have and operate in the HD domain.

While some cameras may have firewire out, using the video output and upconverting before distribution is preferable since longer cable runs can be achieved and quality is superior. Additionally, the BrightEye 90's reference input allows you to time the upconverted video output for use with a production switcher.

### Downconverting to Standard Definition

BrightEye 90 will downconvert any type of HD signal and provides both an SD SDI and an analog composite output suitable for broadcast or monitoring.

### Cross Conversion

It's easy to convert between various HD standards, whether 720p or 1080i. Simply select the output standard you need and connect the input – that's all there is to it.

### Aspect Ratio Conversion

For converting between SD 4:3 and HD 16:9, BrightEye 90 has you covered. Just select the output standard you need and connect the input.

### Audio Processing Made Simple

BrightEye 90 handles both embedded audio and discrete AES digital audio streams. Sixteen channels of embedded audio are supported in BrightEye 90. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved. Audio mixing is available for two of the four embedded groups of audio. The AES I/O ports can be configured for eight channels of incoming audio or for eight channels of audio output. The audio mixer can be used for AES channels as well. Mixer controls are accessed through BrightEye Mac or PC software.

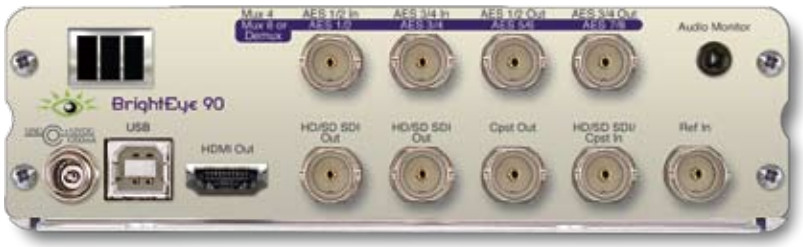
### Monitoring for Video and Audio

Audio monitoring is easy with BrightEye 90's convenient 3.5 mm mini jack. Select the audio channels you want to monitor from the front panel and plug in a headset.

The HDMI connector on the rear of the unit provides a future proof monitoring interface. Plug it into most LCD monitors for confidence monitoring of your feed.

### Front Panel and Software Control

Input selection, gain control, and test pattern controls are provided through the front panel interface. Audio presence LEDs indicate which channels are detected. Controls for crop, letterbox and pillarbox are accessed from the front panel or BrightEye Mac or PC software. Video and audio levels and the audio mixer can be adjusted through BrightEye Mac or PC software.




- Use with Cameras and Projection Systems
- Turn Analog Camera into Digital HD Source
- HD and SD Digital and Analog Composite Video I/O
- AES Digital Audio I/O
- Analog Audio Monitor Output
- Mirror Output Mode for On-Camera Talent
- Graticule and Safe Title Generator
- HDMI Output for Monitoring
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | Analog Composite PAL or NTSC |
| Resolution | Digitized at 12 bits |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) or 1.485Gb/s HD Serial Digital (SMPTE 274M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s |

Automatic Input Cable Equalization

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Analog Video Output

| | |
|---|---|
| Number | One |
| Type | Composite PAL or NTSC |
| Return Loss | >40 dB |
| Output | DC <100 mV |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Type | HD Serial Digital 1.485 Gb/s SMPTE 274M, 292M or 296M or SD Serial Digital 270 Mb/s SMPTE 259M-C |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD<br>300 meters for SD (Belden 1694A) |

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### AES/EBU Digital Inputs

| | |
|---|---|
| Number | Four (total of eight channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 96 KHz (Sample Rate Converted internally to 48KHz) |
| Reference Level | -18 or -20 dBFS (selectable) |

### AES/EBU Digital Outputs

| | |
|---|---|
| Number | Four (total of eight channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 24 Bit |
| Sample Rate | 48 KHz<br>Synchronous to video output |
| Reference Level | -18 or -20 dBFS (selectable) |

### Embedded Output (In Serial Output)

| | |
|---|---|
| Group Assign | Two of four groups |
| Channels | Sixteen passed |
| Bit Depth | 24 Bit |

### Monitor Output

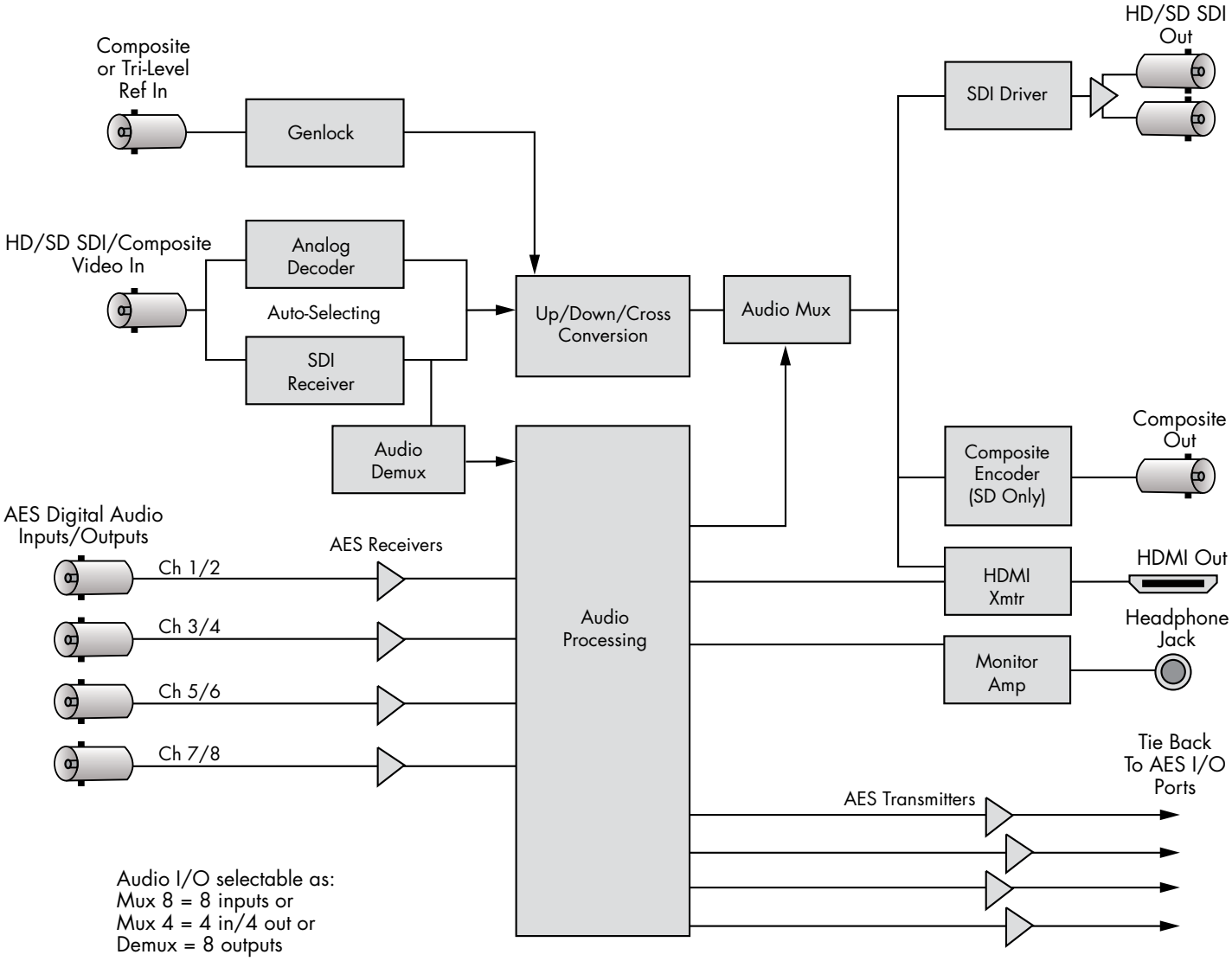
| | |
|---|---|
| Number | One |
| Connector | HDMI |
| Type | Follows SDI out |

### Audio Monitoring Output

| | |
|---|---|
| Number | One (Select from eight channels) |
| Connector | 3.5 mm stereo mini jack |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 12 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |




Audio I/O selectable as:
Mux 8 = 8 inputs or
Mux 4 = 4 in/4 out or
Demux = 8 outputs

Provides embedded pass through of all 16 audio channels

# BrightEye 90-A

## HD Up / Down / Cross Converter and ARC with Analog Audio

### Easy To Use

BrightEye 90-A is a versatile up/down/cross converter or aspect ratio converter for use with analog and digital video signals. Simply set the BrightEye 90-A to output your facility's preferred HD or SD standard. The BrightEye 90-A will accommodate whatever input you connect – analog composite, SD SDI or HD SDI. After setting the output standard, BrightEye 90-A automatically converts the selected input to the correct standard for your facility. BrightEye 90-A will upconvert, downconvert, cross convert, or act as an ARC, as needed. A special Mirror Output Mode can be enabled, causing the output image to be flipped left to right for use with on-camera talent. The built-in Frame Synchronizer allows you to feed asynchronous signals to the BrightEye 90-A. An external reference input allows genlock to a house reference. All vertical interval data and closed captioning is faithfully passed.

### Upconverting to High Definition

Feed the analog composite or SD SDI output of a camera to a BrightEye 90-A and upconvert to HD. You can take the HD signal from the BrightEye 90-A into a switcher or projection system. Upconverting existing SD equipment lets you leverage the equipment you already have and operate in the HD domain.

While some cameras may have firewire out, using the video output and upconverting before distribution is preferable since longer cable runs can be achieved and quality is superior. Additionally, the BrightEye 90-A's reference input allows you to time the upconverted video output for use with a production switcher.

### Downconverting to Standard Definition

BrightEye 90-A will downconvert any type of HD signal and provides both an SD SDI and an analog composite output suitable for broadcast or monitoring.

### Cross Conversion

It's easy to convert between various HD standards, whether 720p or 1080i. Simply select the output standard you need and connect the input – that's all there is to it.

### Aspect Ratio Conversion

For converting between SD 4:3 and HD 16:9, BrightEye 90-A has you covered. Just select the output standard you need and connect the input.

### Audio Processing Made Simple

BrightEye 90-A handles both embedded audio and eight channels of analog audio. Sixteen channels of embedded audio are supported in BrightEye 90-A. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved. Audio mixing is available for two of the four embedded groups of audio. The analog audio I/O ports can be configured for eight channels of incoming audio or for eight channels of audio output. The audio mixer can be used for analog audio as well. Mixer controls are accessed through BrightEye Mac or PC software.

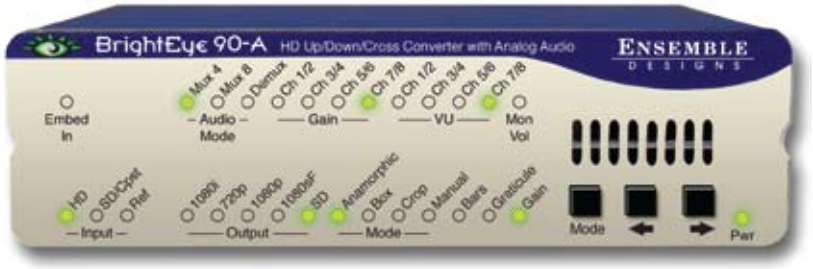
### Monitoring for Video and Audio

Audio monitoring is easy with BrightEye 90-A's convenient 3.5 mm mini jack. Select the audio channels you want to monitor from the front panel and plug in a headset.

The HDMI connector on the rear of the unit provides a future-proof monitoring interface. Plug it into most LCD monitors for confidence-monitoring of your feed.

### Front Panel and Software Control

Input selection, gain control, and test pattern controls are provided through the front panel interface. Audio presence LEDs indicate which channels are detected. Controls for crop, letterbox and pillarbox are accessed from the front panel or BrightEye Mac or PC software. Video and audio levels and the audio mixer can be adjusted through BrightEye Mac or PC software.



- Use with Cameras and Projection Systems
- Turn Analog Camera into Digital HD Source
- HD and SD Digital and Analog Composite Video I/O
- Analog Audio I/O
- Analog Audio Monitor Output
- Mirror Output Mode for On-Camera Talent
- Graticule and Safe Title Generator
- HDMI Output for Monitoring
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | Analog Composite PAL or NTSC |
| Resolution | Digitized at 12 bits |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) or 1.485 Gb/s HD Serial Digital (SMPTE 274M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s |

Automatic Input Cable Equalization

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Analog Video Output

| | |
|---|---|
| Number | One |
| Type | Composite PAL or NTSC |
| Return Loss | >40 dB |
| Output | DC <100 mV |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Type | HD Serial Digital 1.485 Gb/s SMPTE 274M, 292M or 296M or SD Serial Digital 270 Mb/s SMPTE 259M-C |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD<br>300 meters for SD<br>(Belden 1694A) |

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Analog Audio Inputs

| | |
|---|---|
| Number | Eight (selectable as inputs or outputs) |
| Type | Balanced |
| Impedance | >15K Ω |
| Max Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Analog Audio Outputs

| | |
|---|---|
| Number | Eight (selectable as inputs or outputs) |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |
| Resolution | 24 bits, 128 x oversampled |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ± 0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Embedded Output (In Serial Output)

| | |
|---|---|
| Group Assign | Two of four groups |
| Channels | Sixteen passed |
| Bit Depth | 24 Bit |

### Monitor Output

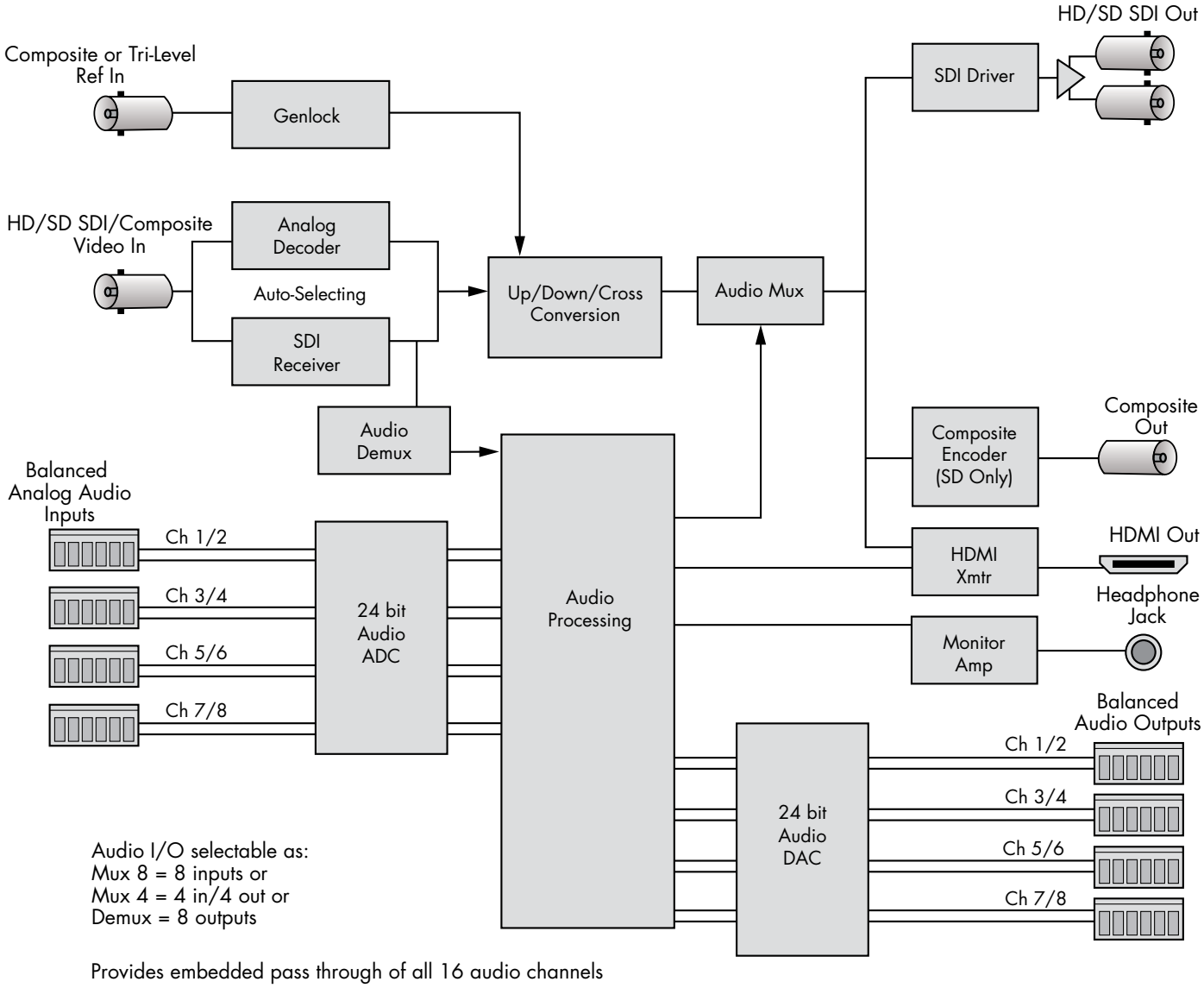
| | |
|---|---|
| Number | One |
| Connector | HDMI |
| Type | Follows SDI out |

### Audio Monitoring Output

| | |
|---|---|
| Number | One (select from eight channels) |
| Connector | 35 mm stereo mini jack |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 15 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |




Audio I/O selectable as:
Mux 8 = 8 inputs or
Mux 4 = 4 in/4 out or
Demux = 8 outputs

Provides embedded pass through of all 16 audio channels

# BrightEye 90-F

## HD Up / Down / Cross Converter and ARC with AES Audio and Optical Output

### Easy To Use

BrightEye 90-F is a versatile up/down/cross converter or aspect ratio converter for use with analog and digital video signals with the addition of an optical output. Optical connectivity allows for long cable runs between buildings or in mobile applications. Simply set the BrightEye 90-F to output your facility's preferred HD or SD standard. The BrightEye 90-F will accommodate whatever input you connect – analog composite, SD SDI or HD SDI. After setting the output standard, BrightEye 90-F automatically converts the selected input to the correct standard for your facility. BrightEye 90-F will upconvert, downconvert, cross convert, or act as an ARC, as needed. The built-in Frame Synchronizer allows you to feed asynchronous signals to the BrightEye 90-F. A special Mirror Output Mode can be enabled, causing the output image to be flipped left to right for use with on-camera talent. An external reference input allows genlock to a house reference. All vertical interval data and closed captioning is faithfully passed.

### Upconverting to High Definition

Feed the analog composite or SD SDI output of a camera to a BrightEye 90-F and upconvert to HD. You can take the HD signal from the BrightEye 90-F into a switcher or projection system. Upconverting existing SD equipment lets you leverage the equipment you already have and operate in the HD domain.

While some cameras may have firewire out, using the video output and upconverting before distribution is preferable since longer cable runs can be achieved and quality is superior. Additionally, the BrightEye 90-F's reference input allows you to time the upconverted video output for use with a production switcher.

### Downconverting to Standard Definition

BrightEye 90-F will downconvert any type of HD signal and provides both an SD SDI and an analog composite output suitable for broadcast or monitoring.

### Cross Conversion

It's easy to convert between various HD standards, whether 720p or 1080i. Simply select the output standard you need and connect the input – that's all there is to it.

### Aspect Ratio Conversion

For converting between SD 4:3 and HD 16:9, BrightEye 90-F has you covered. Just select the output standard you need and connect the input.

### Audio Processing Made Simple

BrightEye 90-F handles both embedded audio and discrete AES digital audio streams. Sixteen channels of embedded audio are supported in BrightEye 90-F. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved. Audio mixing is available for two of the four embedded groups of audio. The AES I/O ports can be configured for eight channels of incoming audio or for eight channels of audio output. The audio mixer can be used for AES channels as well. Mixer controls are accessed through BrightEye Mac or PC software.

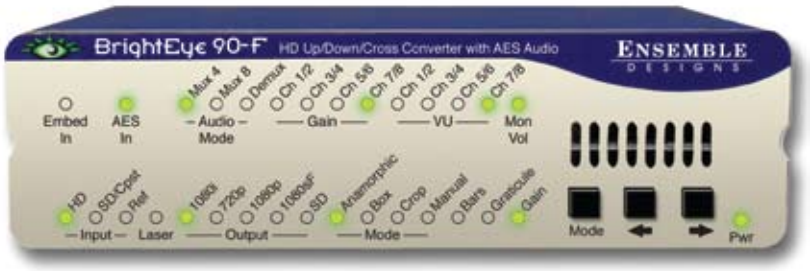
### Monitoring for Video and Audio

Audio monitoring is easy with BrightEye 90-F's convenient 3.5 mm mini jack. Select the audio channels you want to monitor from the front panel and plug in a headset.

The HDMI connector on the rear of the unit provides a future proof monitoring interface. Plug it into most LCD monitors for confidence monitoring of your feed.

### Front Panel and Software Control

Input selection, gain control, and test pattern controls are provided through the front panel interface. Audio presence LEDs indicate which channels are detected. Controls for crop, letterbox and pillarbox are accessed from the front panel or BrightEye Mac or PC software. Video and audio levels and the audio mixer can be adjusted through BrightEye Mac or PC software.



- Use with Cameras and Projection Systems
- Turn Analog Camera into Digital HD Source
- HD and SD Digital and Analog Composite Video I/O
- AES Digital Audio I/O
- Analog Audio Monitor Output
- Mirror Output Mode for On-Camera Talent
- Graticule and Safe Title Generator
- HDMI Output for Monitoring
- Optical Output for long cable runs
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | Analog Composite PAL or NTSC |
| Resolution | Digitized at 12 bits |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) or 1.485 Gb/s HD Serial Digital (SMPTE 274M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s |

Automatic Input Cable Equalization

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video PAL or NTSC<br>or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Analog Video Output

| | |
|---|---|
| Number | One |
| Type | Composite PAL or NTSC |
| Return Loss | >40 dB |
| Output | DC <100 mV |

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Type | HD Serial Digital 1.485 Gb/s SMPTE 274M, 292M or 296M or SD Serial Digital 270 Mb/s SMPTE 259M-C |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD<br>300 meters for SD (Belden 1694A) |

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Embedded Output (In Serial Output)

| | |
|---|---|
| Group Assign | Two of four groups |
| Channels | Sixteen passed |
| Bit Depth | 24 Bit |

### AES/EBU Digital Inputs

| | |
|---|---|
| Number | Four (total of eight channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 96 KHz (Sample Rate Converted internally to 48 KHz) |
| Reference Level | -18 or -20 dBFS (selectable) |

### AES/EBU Digital Outputs

| | |
|---|---|
| Number | Four (total of eight channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 24 Bit |
| Sample Rate | 48 KHz<br>Synchronous to video output |
| Reference Level | -18 or -20 dBFS (selectable) |

### Optical Output

| | |
|---|---|
| Number | One |
| Type | SD (SMPTE 297M, optical equivalent of 259M)<br>HD (SMPTE 274M or 296M) |
| Wavelength | 1310 nm (1550 by special order) |
| Power | -7 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | SC |

### Monitor Output

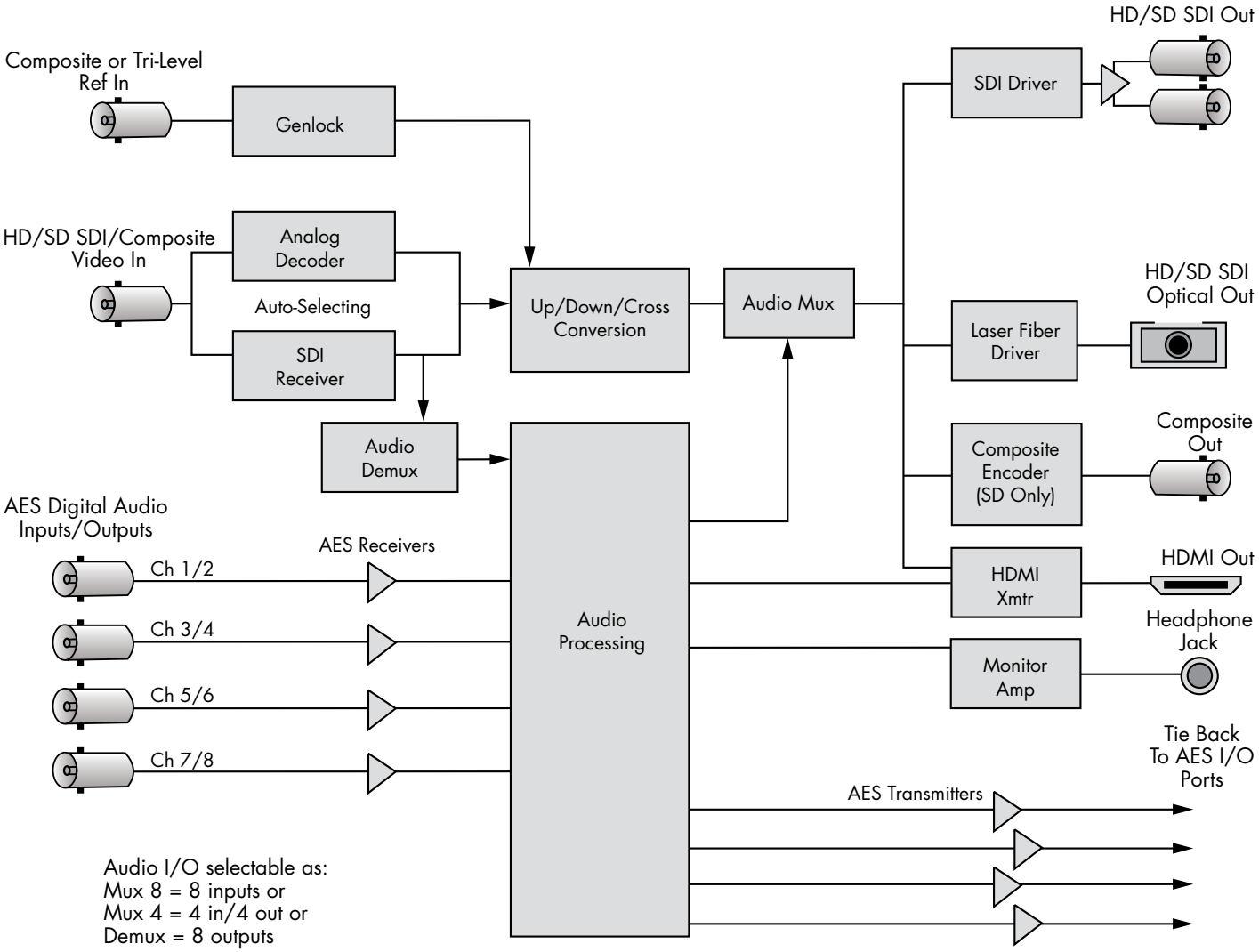
| | |
|---|---|
| Number | One |
| Connector | HDMI |
| Type | Follows SDI out |

### Audio Monitoring Output

| | |
|---|---|
| Number | One (Select from eight channels) |
| Connector | 3.5 mm stereo mini jack |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 12 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |


Composite or Tri-Level Ref In
Genlock
HD/SD SDI/Composite Video In
Analog Decoder
Auto-Selecting
SDI Receiver
Up/Down/Cross Conversion
Audio Mux
SDI Driver
HD/SD SDI Out
Laser Fiber Driver
HD/SD SDI Optical Out
Composite Encoder (SD Only)
Composite Out
Audio Demux
AES Digital Audio Inputs/Outputs
AES Receivers
Ch 1/2
Ch 3/4
Ch 5/6
Ch 7/8
Audio Processing
HDMI Xmtr
HDMI Out
Monitor Amp
Headphone Jack
Tie Back To AES I/O Ports
AES Transmitters
Audio I/O selectable as:
Mux 8 = 8 inputs or
Mux 4 = 4 in/4 out or
Demux = 8 outputs

# BrightEye 90-FA

## HD UP / Down / Cross Converter and ARC with Analog Audio and Optical Output

### Easy To Use

BrightEye 90-FA is a versatile up/down/cross converter or aspect ratio converter for use with analog and digital video signals with the addition of an optical output. Optical connectivity allows for long cable runs between buildings or in mobile applications. Simply set the BrightEye 90-FA to output your facility's preferred HD or SD standard. The BrightEye 90-FA will accommodate whatever input you connect – analog composite, SD SDI or HD SDI. After setting the output standard, BrightEye 90-FA automatically converts the selected input to the correct standard for your facility. BrightEye 90-FA will upconvert, downconvert, cross convert, or act as an ARC, as needed. The built-in Frame Synchronizer allows you to feed asynchronous signals to the BrightEye 90-FA. A special Mirror Output Mode can be enabled, causing the output image to be flipped left to right for use with on-camera talent. An external reference input allows genlock to a house reference. All vertical interval data and closed captioning is faithfully passed.

### Upconverting to High Definition

Feed the analog composite or SD SDI output of a camera to a BrightEye 90-FA and upconvert to HD. You can take the HD signal from the BrightEye 90-FA into a switcher or projection system. Upconverting existing SD equipment lets you leverage the equipment you already have and operate in the HD domain.

While some cameras may have firewire out, using the video output and upconverting before distribution is preferable since longer cable runs can be achieved and quality is superior. Additionally, the BrightEye 90-FA's reference input allows you to time the upconverted video output for use with a production switcher.

### Downconverting to Standard Definition

BrightEye 90-FA will downconvert any type of HD signal and provides both an SD SDI and an analog composite output suitable for broadcast or monitoring.

### Cross Conversion

It's easy to convert between various HD standards, whether 720p or 1080i. Simply select the output standard you need and connect the input – that's all there is to it.

### Aspect Ratio Conversion

For converting between SD 4:3 and HD 16:9, BrightEye 90-FA has you covered. Just select the output standard you need and connect the input.

### Audio Processing Made Simple

BrightEye 90-FA handles both embedded audio and eight channels of analog audio. Sixteen channels of embedded audio are supported in BrightEye 90-FA. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved. Audio mixing is available for two of the four embedded groups of audio. The analog audio I/O ports can be configured for eight channels of incoming audio or for eight channels of audio output. The audio mixer can be used for analog audio as well. Mixer controls are accessed through BrightEye Mac or PC software.

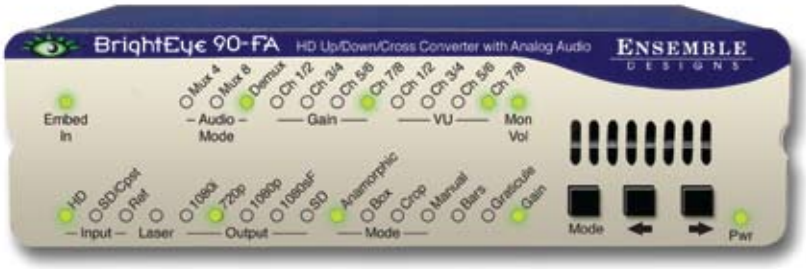
### Monitoring for Video and Audio

Audio monitoring is easy with BrightEye 90-FA's convenient 3.5 mm mini jack. Select the audio channels you want to monitor from the front panel and plug in a headset.

The HDMI connector on the rear of the unit provides a future proof monitoring interface. Plug it into most LCD monitors for confidence monitoring of your feed.

### Front Panel and Software Control

Input selection, gain control, and test pattern control are provided through the front panel interface. Audio presence LEDs indicate which channels are detected. Controls for crop, letterbox and pillarbox are accessed from the front panel or BrightEye Mac or PC software. Video and audio levels and the audio mixer can be adjusted through BrightEye Mac or PC software.



- Use with Cameras and Projection Systems
- Turn Analog Camera into Digital HD Source
- HD and SD Digital and Analog Composite Video I/O
- Analog Audio I/O
- Analog Audio Monitor Output
- Mirror Output Mode for On-Camera Talent
- Graticule and Safe Title Generator
- HDMI Output for Monitoring
- Optical Output for long cable runs
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | Analog Composite PAL or NTSC |
| Resolution | Digitized at 12 bits |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) or 1.485 Gb/s HD Serial Digital (SMPTE 274M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters for 270 Mb/s<br>100 meters for 1.485 Gb/s |

Automatic Input Cable Equalization

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Analog Video Output

| | |
|---|---|
| Number | One |
| Type | Composite PAL or NTSC |
| Return Loss | >40 dB |
| Output | DC <100 mV |

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Type | HD Serial Digital 1.485 Gb/s SMPTE 274M, 292M or 296M or SD Serial Digital 270 Mb/s SMPTE 259M-C |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD<br>300 meters for SD (Belden 1694A) |

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Analog Audio Inputs

| | |
|---|---|
| Number | Eight (selectable as inputs or outputs) |
| Type | Balanced |
| Impedance | >15K Ω |
| Max Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Analog Audio Outputs

| | |
|---|---|
| Number | Eight (selectable as inputs or outputs) |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |
| Resolution | 24 bits, 128 x oversampled |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ± 0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Embedded Output (In Serial Output)

| | |
|---|---|
| Group Assign | Two of four groups |
| Channels | Sixteen passed |
| Bit Depth | 24 Bit |

### Optical Output

| | |
|---|---|
| Number | One |
| Type | SD (SMPTE 297M, optical equivalent of 259M)<br>HD (SMPTE 274M or 296M) |
| Wavelength | 1310 nm (1550 by special order) |
| Power | -7 dBm |
| Max Cable Length | 20 km |
| Fiber Type | Single Mode<br>Multi-mode compatible with 8 dB attenuation at transmit end |
| Connector | SC |

### Monitor Output

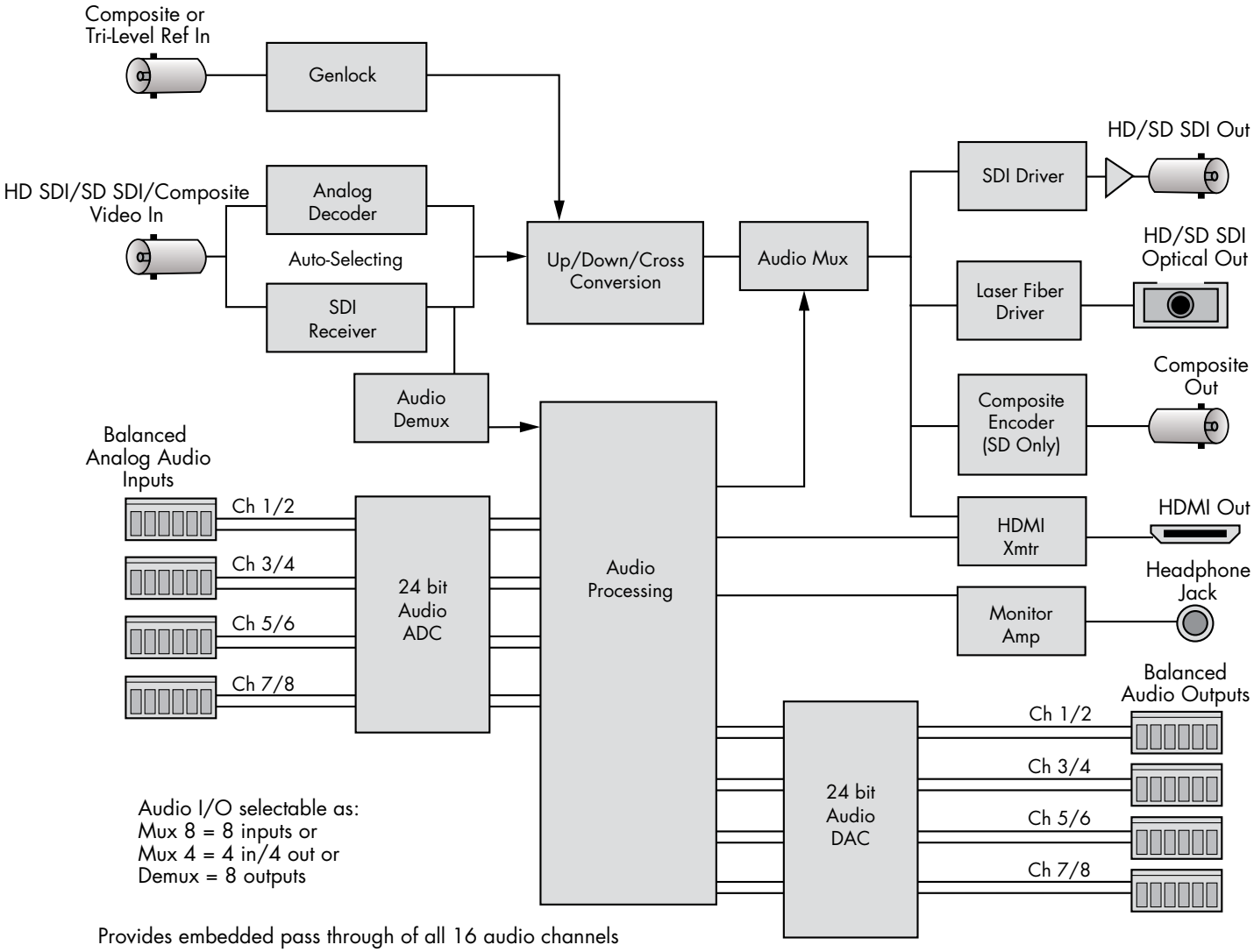
| | |
|---|---|
| Number | One |
| Connector | HDMI |
| Type | Follows SDI out |

### Audio Monitoring Output

| | |
|---|---|
| Number | One (select from eight channels) |
| Connector | 3.5 mm stereo mini jack |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 15 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |


Composite or
Tri-Level Ref In
Genlock
HD SDI/SD SDI/Composite
Video In
Analog
Decoder
Auto-Selecting
SDI
Receiver
Up/Down/Cross
Conversion
Audio Mux
SDI Driver
HD/SD SDI Out
Laser Fiber
Driver
HD/SD SDI
Optical Out
Composite
Encoder
(SD Only)
Composite
Out
HDMI
Xmtr
HDMI Out
Monitor
Amp
Headphone
Jack
Audio
Demux
Balanced
Analog Audio
Inputs
Ch 1/2
Ch 3/4
Ch 5/6
Ch 7/8
24 bit
Audio
ADC
Audio
Processing
24 bit
Audio
DAC
Balanced
Audio Outputs
Ch 1/2
Ch 3/4
Ch 5/6
Ch 7/8
Audio I/O selectable as:
Mux 8 = 8 inputs or
Mux 4 = 4 in/4 out or
Demux = 8 outputs
Provides embedded pass through of all 16 audio channels

# BrightEye 91

## HD Upconverter with AES Audio

### Easy To Use

BrightEye 91 is an upconverter with analog composite and SD SDI inputs. Feed the analog composite or SD SDI output of a camera to a BrightEye 91 and upconvert to HD. You can take the HD signal from the BrightEye 91 into a switcher or projection system. Upconverting existing SD equipment lets you leverage the equipment you already have and operate in the HD domain.

A special Mirror Output Mode can be enabled, causing the output image to be flipped left to right for use with on-camera talent. An external reference input allows genlock to a house reference. All vertical interval data and closed captioning is faithfully passed.

### Upconvert Before Distribution

While some cameras may have firewire out, using the video output and upconverting before distribution is preferable since longer cable runs can be achieved and quality is superior. Additionally, the BrightEye 91's reference input allows you to time the upconverted video output for use with a production switcher.

### Audio Processing

BrightEye 91 handles both embedded audio and discrete AES digital audio inputs. Sixteen channels of embedded audio are supported in BrightEye 91. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved. Audio mixing is available for two of the four embedded groups of audio.

### Audio Monitoring

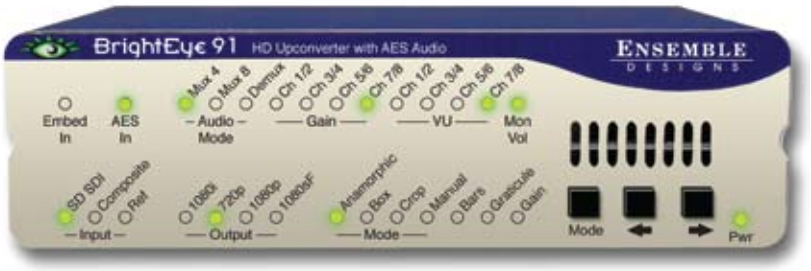
Audio monitoring is easy with BrightEye 91's convenient 3.5 mm mini jack. Just select the audio channels you want to monitor from the front panel and plug in a headset.

### Monitoring with HDMI

The HDMI connector on the rear of the unit provides a future proof monitoring interface. Plug it into most LCD monitors for confidence monitoring of your feed.

### Front Panel and Software Control

Input selection, gain control, and test pattern controls are provided through the front panel interface. Audio presence LEDs indicate which channels are detected. Controls for crop, letterbox and pillarbox are accessed from the front panel or BrightEye Mac or PC software. Video and audio levels and the audio mixer can be adjusted through BrightEye Mac or PC software.



- Use with Cameras and Projection Systems
- Turn Analog Camera into Digital HD Source
- SD Digital and Analog Composite Video Inputs
- AES Inputs
- Analog Audio Monitor Output
- Mirror Output Mode for On-Camera Talent
- Graticule and Safe Generator
- HDMI Output for Monitoring
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | Analog Composite PAL or NTSC |
| Resolution | Digitized at 12 bits |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters for 270 Mb/s |

Automatic Input Cable Equalization

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Type | HD Serial Digital 1.485 Gb/s SMPTE 274M, 292M or 296M |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD (Belden 1694A) |

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### AES/EBU Digital Inputs

| | |
|---|---|
| Number | Four (total of eight channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 20 and 24 Bit |
| Sample Rate | 30 KHz to 96 KHz (Sample Rate Converted internally to 48 KHz) |
| Reference Level | -18 or -20 dBFS (selectable) |

### AES/EBU Digital Outputs

| | |
|---|---|
| Number | Four (total of eight channels) (selectable as inputs or outputs) |
| Type | AES3id |
| Connector | Coaxial, 75 Ω |
| Bit Depth | 24 Bit |
| Sample Rate | 48 KHz Synchronous to video output |
| Reference Level | -18 or -20 dBFS (selectable) |

### Embedded Output (In Serial Output)

| | |
|---|---|
| Group Assign | Two of four groups |
| Channels | Sixteen passed |
| Bit Depth | 24 Bit |

### Monitor Output

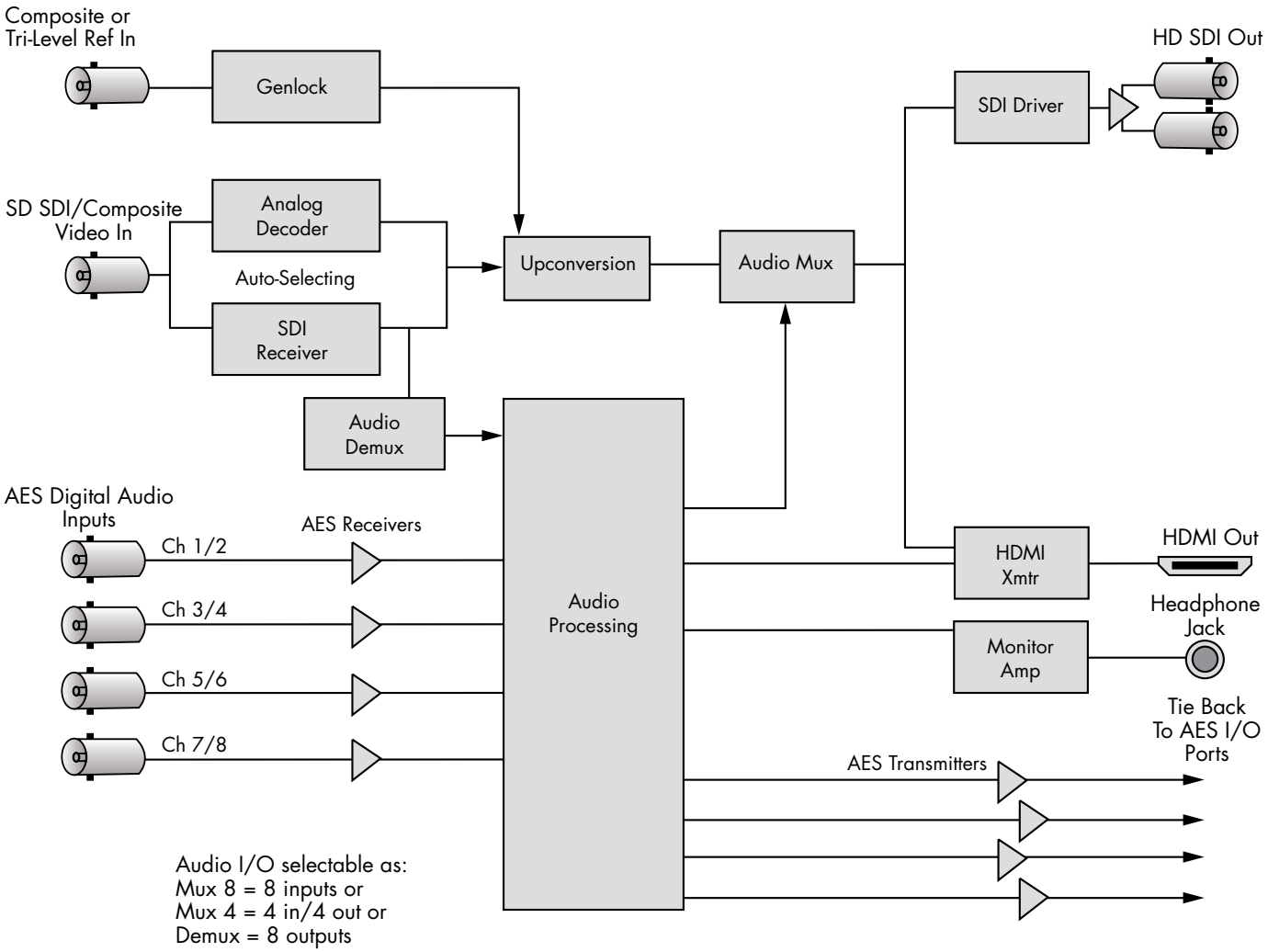
| | |
|---|---|
| Number | One |
| Connector | HDMI |
| Type | Follows SDI out |

### Audio Monitoring Output

| | |
|---|---|
| Number | One (select from eight channels) |
| Connector | 3.5 mm stereo mini jack |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 11 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |




Audio I/O selectable as:
Mux 8 = 8 inputs or
Mux 4 = 4 in/4 out or
Demux = 8 outputs

Provides embedded pass through of all 16 audio channels

# BrightEye 91-A

## HD Upconverter with Analog Audio

### Easy To Use

BrightEye 91-A is an upconverter with analog composite and SD SDI inputs. Feed the analog composite or SD SDI output of a camera to a BrightEye 91-A and upconvert to HD. You can take the HD signal from the BrightEye 91-A into a switcher or projection system. Upconverting existing SD equipment lets you leverage the equipment you already have and operate in the HD domain. A special Mirror Output Mode can be enabled, causing the output image to be flipped left to right for use with on-camera talent. An external reference input allows genlock to a house reference. All vertical interval data and closed captioning is faithfully passed.

### Upconvert Before Distribution

While some cameras may have firewire out, using the video output and upconverting before distribution is preferable since longer cable runs can be achieved and quality is superior. Additionally, the BrightEye 91-A's reference input allows you to time the upconverted video output for use with a production switcher.

### Audio Processing

BrightEye 91-A handles both embedded audio and eight analog audio inputs. Sixteen channels of embedded audio are supported in BrightEye 91-A. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved. Audio mixing is available for two of the four embedded groups of audio.

### Audio Monitoring

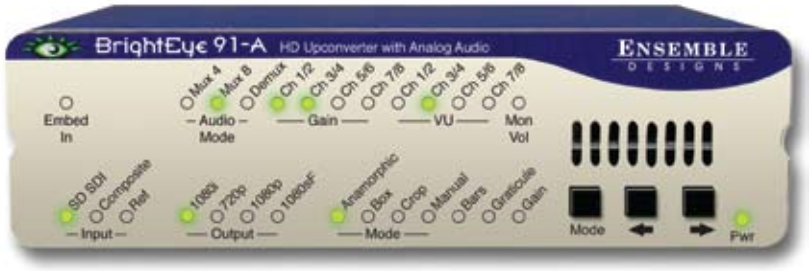
Audio monitoring is easy with BrightEye 91-A's convenient 3.5 mm mini jack. Just select the audio channels you want to monitor from the front panel and plug in a headset.

### Monitoring with HDMI

The HDMI connector on the rear of the unit provides a future proof monitoring interface. Plug it into most LCD monitors for confidence monitoring of your feed.

### Front Panel and Software Control

Input selection, gain control, and test patterns control are provided through the front panel interface. Audio presence LEDs indicate which channels are detected. Controls for crop, letterbox and pillarbox are accessed from the front panel or BrightEye Mac or PC software. Video and audio levels and the audio mixer can be adjusted through BrightEye Mac or PC software.



- Use with Cameras and Projection Systems
- Turn Analog Camera into Digital HD Source
- SD Digital and Analog Composite Video Inputs
- Analog Audio Inputs
- Analog Audio Monitor Output
- Mirror Output Mode for On-Camera Talent
- Graticule and Safe Title Generator
- HDMI Output
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | Analog Composite PAL or NTSC |
| Resolution | Digitized at 12 bits |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15dB |
| Max Cable Length | 300 meters for 270 Mb/s |

Automatic Input Cable Equalization

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Type | HD Serial Digital 1.485 Gb/s SMPTE 274M, 292M or 296M |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD (Belden 1694A) |

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Analog Audio Inputs

| | |
|---|---|
| Number | Eight (selectable as inputs or outputs) |
| Type | Balanced |
| Impedance | >15K Ω |
| Max Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Analog Audio Outputs

| | |
|---|---|
| Number | Eight (selectable as inputs or outputs) |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |
| Resolution | 24 bits, 128 x oversampled |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ± 0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Embedded Output (In Serial Output)

| | |
|---|---|
| Group Assign | Two of four groups |
| Channels | Sixteen passed |
| Bit Depth | 24 Bit |

### Monitor Output

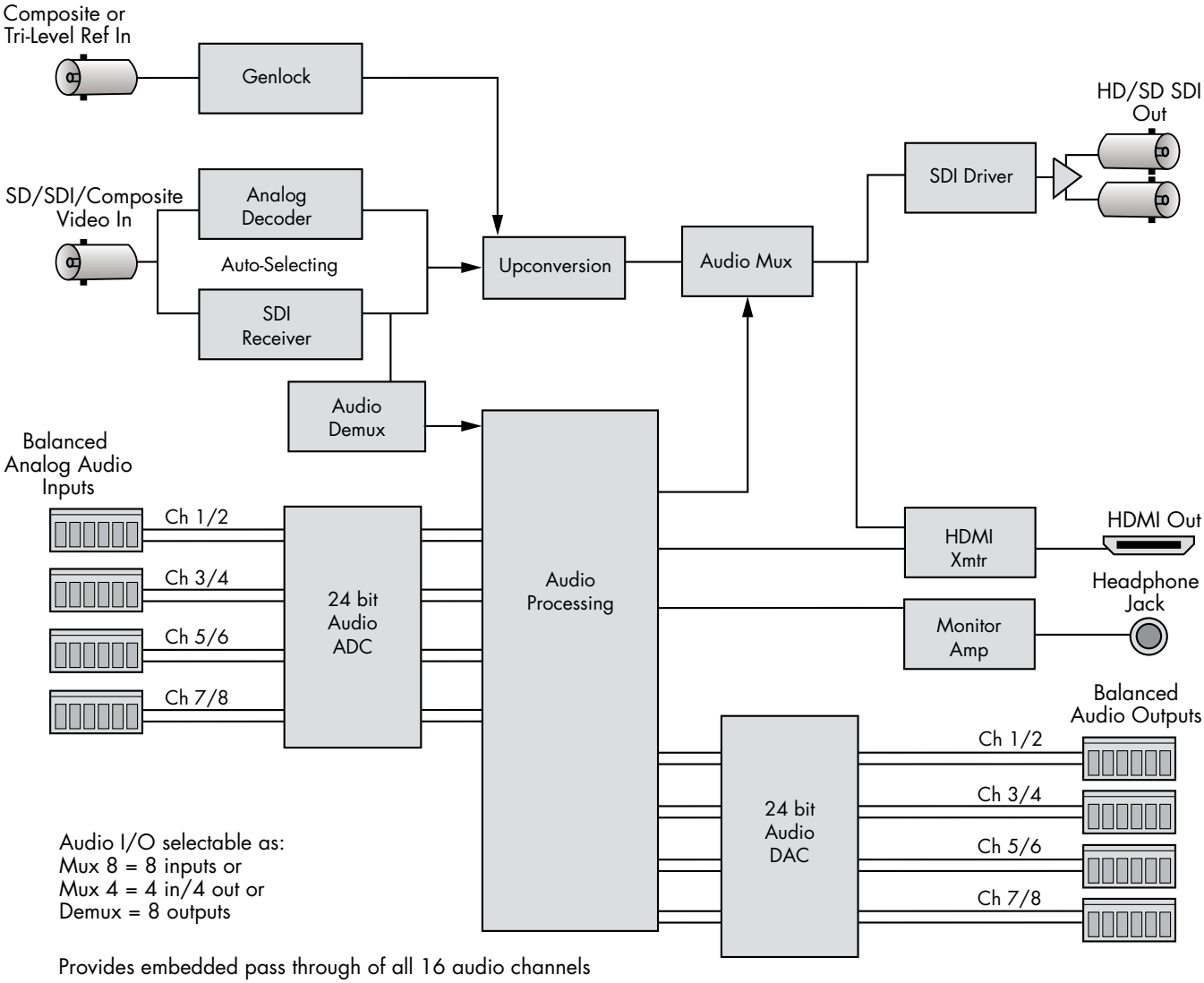
| | |
|---|---|
| Number | One |
| Connector | HDMI |
| Type | Follows SDI out |

### Audio Monitoring Output

| | |
|---|---|
| Number | One (select from eight channels) |
| Connector | 3.5 mm stereo mini jack |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 14 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |




Audio I/O selectable as:
Mux 8 = 8 inputs or
Mux 4 = 4 in/4 out or
Demux = 8 outputs

Provides embedded pass through of all 16 audio channels

# BrightEye 92-A

## HD Downconverter with Analog Audio

### Easy To Use

BrightEye 92-A will downconvert any type of HD signal and provides both an SD SDI output and an analog composite output that are suitable for broadcast or monitoring. The built-in Frame Synchronizer allows you to feed asynchronous signals to the BrightEye 92-A. A special Mirror Output Mode can be enabled, causing the output image to be flipped left to right for use with on-camera talent. An external reference input allows genlock to a house reference. All vertical interval data and closed captioning is faithfully passed.

### Downconverting to Standard Definition

BrightEye 92-A will downconvert any type of HD signal and provides both an SD SDI and an analog composite output suitable for broadcast or monitoring.

### Audio Processing

BrightEye 92-A handles both embedded audio and analog audio. Sixteen channels of embedded audio are supported in BrightEye 92-A. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved. Audio mixing is available for two of the four embedded groups of audio.

### Audio Monitoring

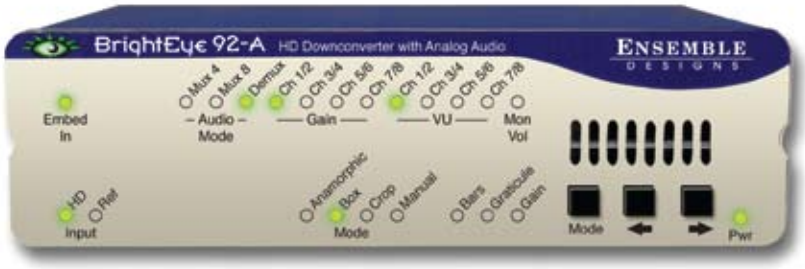
Audio monitoring is easy with BrightEye 92-A's convenient 3.5 mm mini jack. Select the audio channels you want to monitor from the front panel and plug in a headset.

### Monitoring with HDMI

The HDMI connector on the rear of the unit provides a future proof monitoring interface. Plug it into most LCD monitors for confidence monitoring of your feed.

### Front Panel and Software Control

Input selection, gain control, and test pattern controls are provided through the front panel interface. Audio presence LEDs indicate which channels are detected. Controls for crop, letterbox and pillarbox are accessed from the front panel or BrightEye Mac or PC software. Video and audio levels and the audio mixer can be adjusted through BrightEye Mac or PC software.



- Downconversion for monitoring or broadcast
- SD Digital and Analog Composite Video Outputs
- Analog Audio Inputs and Outputs
- Analog Audio Monitor Output
- Mirror Output Mode for On-Camera Talent
- Graticule and Safe Title Generator
- HDMI Output for Monitoring
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15dB |
| Max Cable Length | 100 meters for 1.485 Gb/s |

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Analog Video Output

| | |
|---|---|
| Number | One |
| Type | Composite PAL or NTSC |
| Return Loss | >40 dB |
| Output | DC <100 mV |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Type | SD Serial Digital 270 Mb/s SMPTE 259M-C |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |

Automatic Input Cable Equalization

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Analog Audio Inputs

| | |
|---|---|
| Number | Eight (selectable as inputs or outputs) |
| Type | Balanced |
| Impedance | >15K Ω |
| Max Input Level | 24 dBu |
| CMRR | >60 dB, 20 Hz to 10 KHz |
| Quantization | 24 bits, 128 x oversampled |
| Sample Rate | 48 KHz |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ±0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Analog Audio Outputs

| | |
|---|---|
| Number | Eight (selectable as inputs or outputs) |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |
| Resolution | 24 bits, 128 x oversampled |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ± 0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### Embedded Output (In Serial Output)

| | |
|---|---|
| Group Assign | Two of four groups |
| Channels | Sixteen passed |
| Bit Depth | 24 Bit |

### Monitor Output

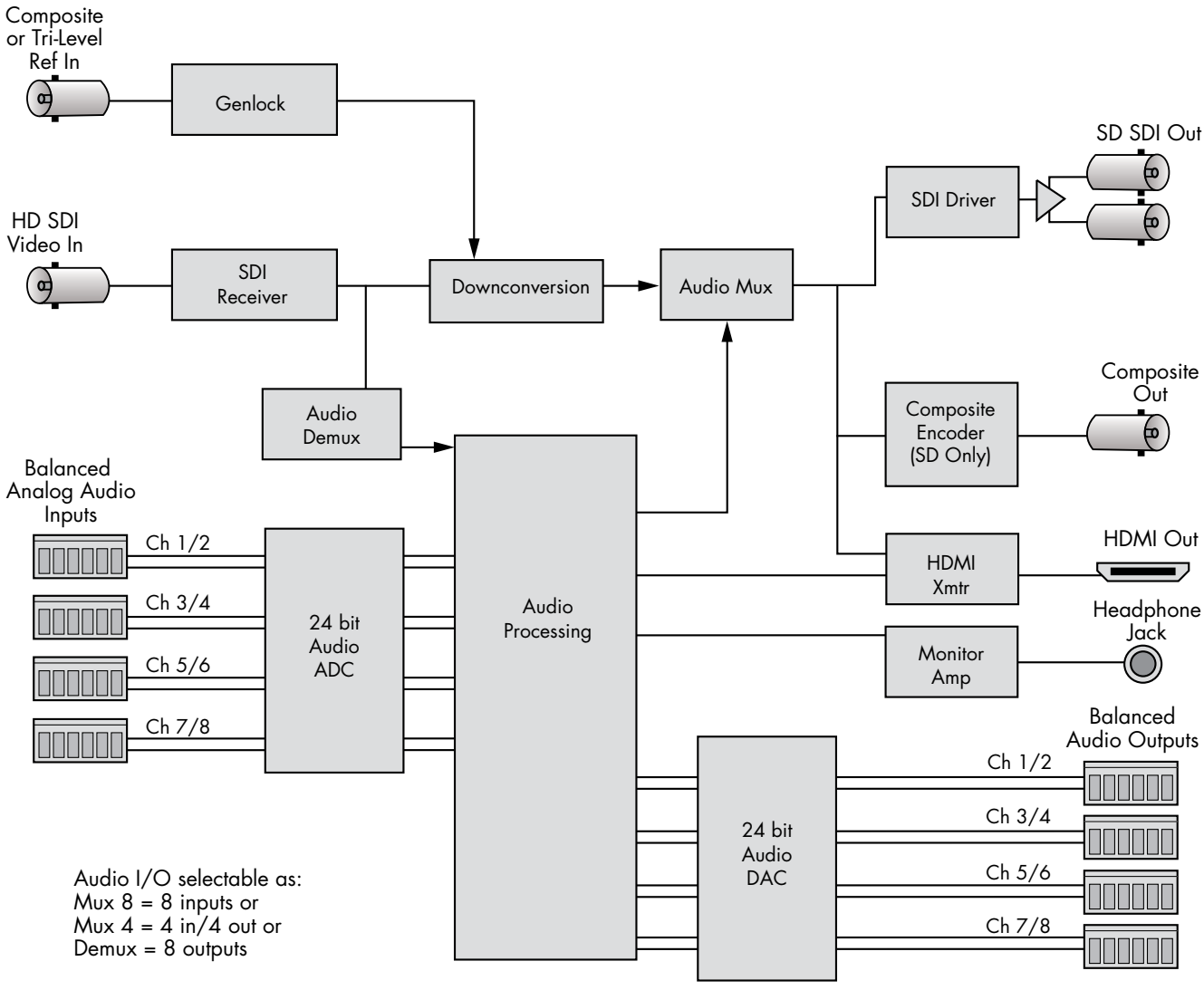
| | |
|---|---|
| Number | One |
| Connector | HDMI |
| Type | Follows SDI out |

### Audio Monitoring Output

| | |
|---|---|
| Number | One (select from eight channels) |
| Connector | 3.5 mm stereo mini jack |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 12 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |




Audio I/O selectable as:
Mux 8 = 8 inputs or
Mux 4 = 4 in/4 out or
Demux = 8 outputs

Provides embedded pass through of all 16 audio channels

# BrightEye 92-M

## HD Downconverter

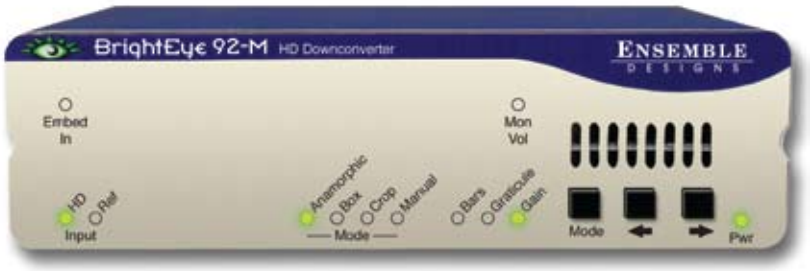
BrightEye 92-M will downconvert any type of HD signal and provides both an SD SDI output and an analog composite output that are suitable for broadcast or monitoring. A special Mirror Output Mode can be enabled, causing the output image to be flipped left to right for use with on-camera talent. The built-in Frame Synchronizer allows you to feed asynchronous signals to the BrightEye 92-M. An external reference input allows genlock to a house reference.

All vertical interval data and closed captioning is faithfully passed. Sixteen channels of embedded audio are supported. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved.

Audio monitoring is easy with BrightEye 92-M's convenient 3.5 mm mini jack. Just select the audio channels you want to monitor from the front panel and plug in a headset.

The HDMI connector on the rear of the unit provides a future proof monitoring interface. Plug it into most LCD monitors for confidence monitoring of your feed.

Input selection, gain control, and test pattern controls are provided through the front panel interface. Audio presence LEDs indicate which channels are detected. Controls for crop, letterbox and pillarbox are accessed from the front panel or BrightEye Mac or PC software.



- Downconversion for monitoring or broadcast
- SD Digital and Analog Composite Video Outputs
- Analog Audio Monitor Output
- Mirror Output Mode for On-Camera Talent
- Graticule and Safe Title Generator
- HDMI Output for Monitoring
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15dB |
| Max Cable Length | 100 meters for 1.485 Gb/s |

Automatic Input Cable Equalization

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Analog Video Output

| | |
|---|---|
| Number | One |
| Type | Composite PAL or NTSC |
| Return Loss | >40 dB |
| Output | DC < 100 mV |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Type | SD Serial Digital 270 Mb/s SMPTE 259M-C |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Monitor Output

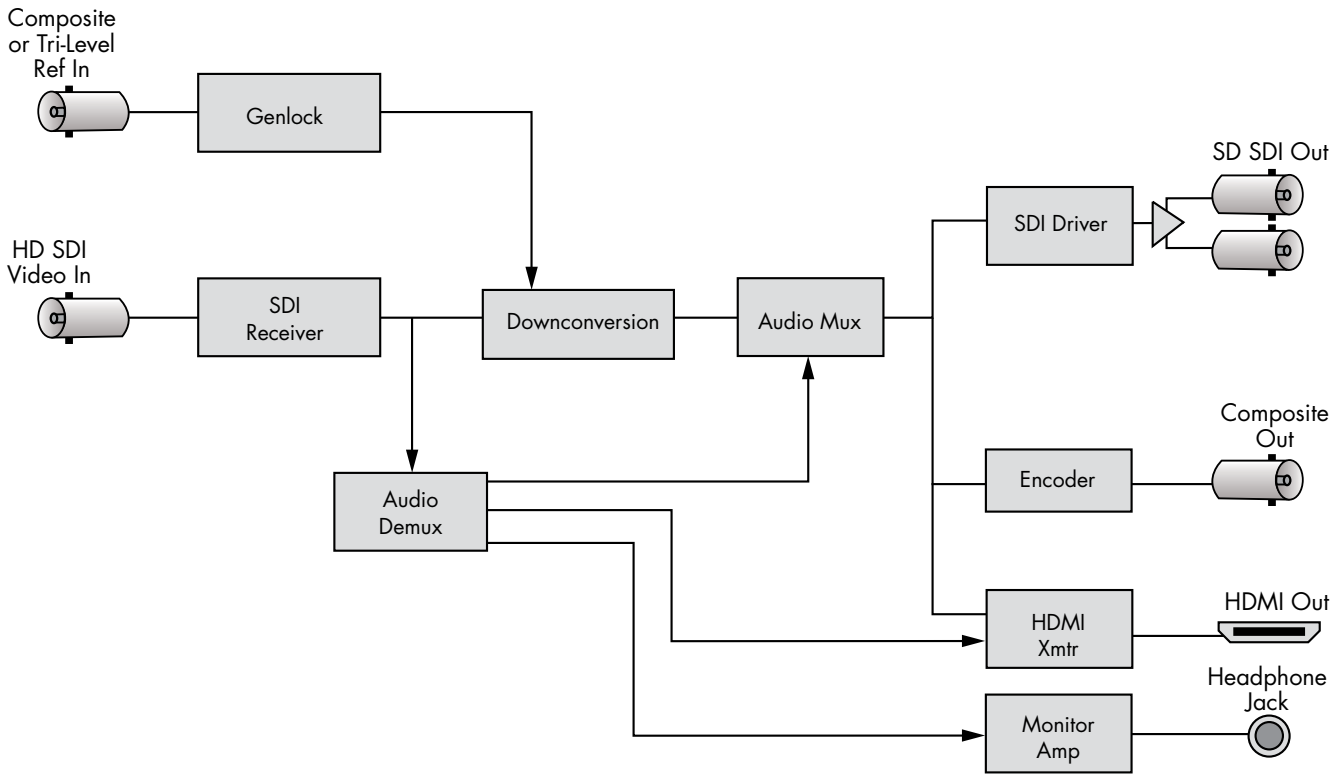
| | |
|---|---|
| Number | One |
| Connector | HDMI |
| Type | Follows SDI out |

### Audio Monitoring Output

| | |
|---|---|
| Number | One (select from eight channels) |
| Connector | 3.5 mm stereo mini jack |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 10 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |




Provides embedded pass through of all 16 audio channels

# BrightEye 92-MA

## HD Downconverter with Analog Audio

BrightEye 92-MA will downconvert any type of 1.5 Gb/s HD signal and provide both an SD SDI output and an analog composite output that are suitable for broadcast or monitoring. Two channels of analog audio out are also provided.

All vertical interval data and closed captioning is faithfully passed. Sixteen channels of embedded audio are supported. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved.

The HDMI connector on the rear of the unit provides a future proof monitoring interface. Plug it into most LCD monitors for confidence monitoring of your feed.

Conversion mode, video gain, and audio gain can be adjusted from the front panel or BrightEye Mac or PC software.

- Downconversion for Monitoring or Broadcast
- SD Digital and Analog Composite Video Outputs
- Analog Audio Outputs
- HDMI Output for Monitoring
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15dB to 1.485 GHz |
| Max Cable Length | 100 meters for 1.485 Gb/s |

Automatic Input Cable Equalization

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Analog Video Output

| | |
|---|---|
| Number | One |
| Type | Composite PAL or NTSC |
| Return Loss | >40 dB |
| Output | DC < 100 mV |

### Serial Digital Output

| | |
|---|---|
| Number | One |
| Type | SD Serial Digital 270 Mb/s SMPTE 259M-C |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15dB to 1.485 GHz |
| Max Cable Length | 300 meters |

### Monitor Output

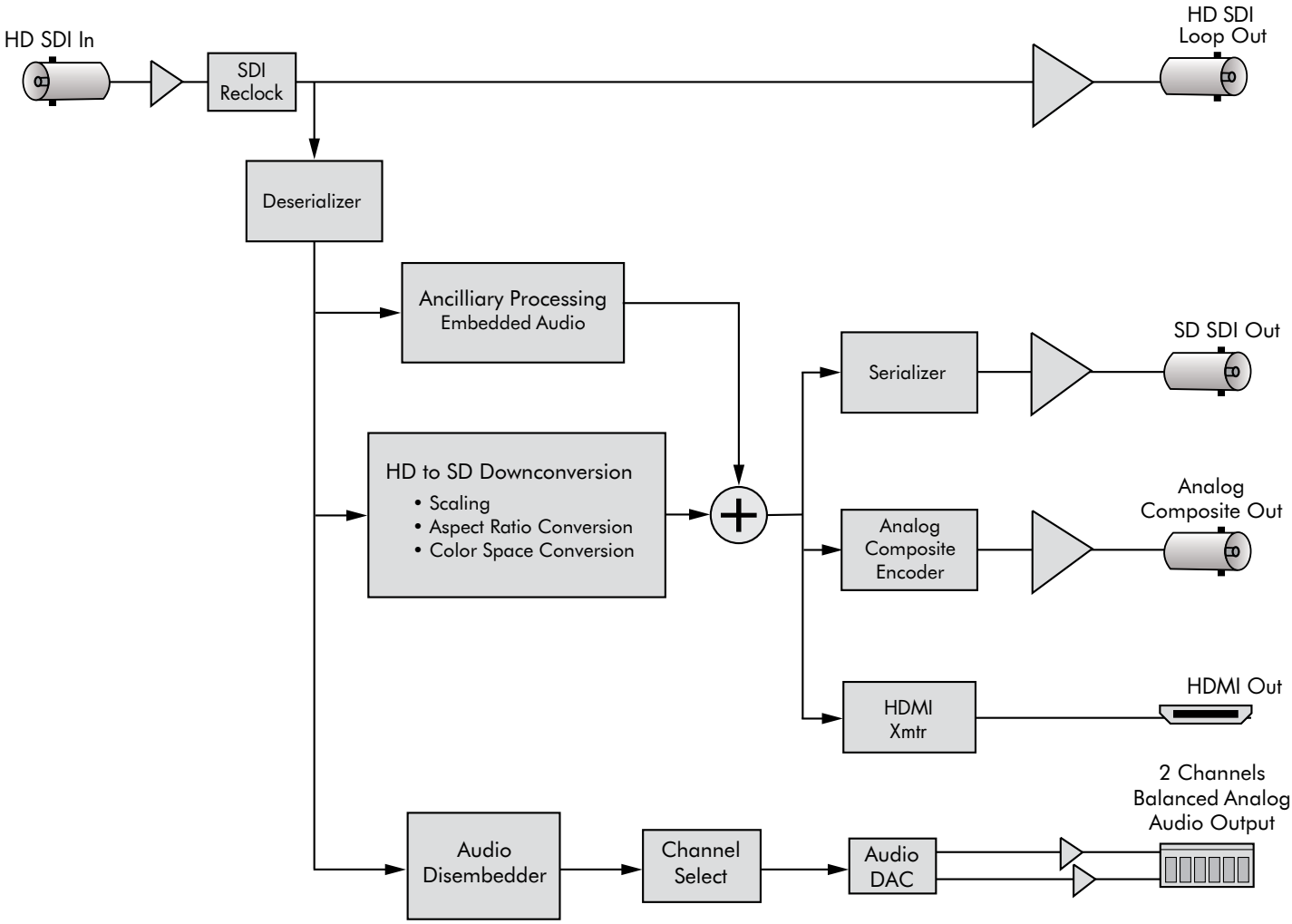
| | |
|---|---|
| Number | One |
| Connector | HDMI |
| Type | Follows SDI out |

### Analog Audio Outputs

| | |
|---|---|
| Number | Two |
| Type | Balanced, transformerless |
| Impedance | 30 Ω |
| Maximum Output Level | 24 dBu |
| Resolution | 24 bit, 128 x oversampled |
| Reference Level | -10 dBu or +4 dBu |
| Frequency Response | ± 0.1 dB, 20 Hz to 20 KHz |
| Crosstalk | <106 dB |
| Dynamic Range | >106 dB |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 0.8 " H x 5.5" D (143 mm x 20 mm x 140 mm) including connectors |
| Power | 12 volts, 12 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |



# BrightEye 93

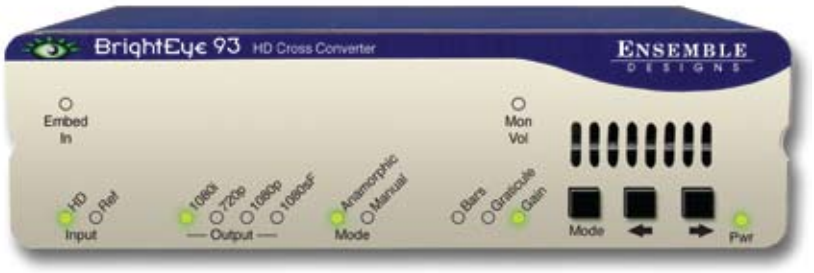
## HD Cross Converter

BrightEye 93 converts between various HD standards, whether 720p or 1080i. Simply select the output standard you need and connect the input – that's all there is to it. A special Mirror Output Mode can be enabled, causing the output image to be flipped left to right for use with on-camera talent. An external reference input allows genlock to a house reference.

All vertical interval data and closed captioning is faithfully passed. Sixteen channels of embedded audio are supported. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved.

An external reference input allows genlock to a house reference. All vertical interval data and closed captioning are faithfully passed.

Input selection, gain control, and test pattern controls are provided through the front panel interface. Audio presence LEDs indicate which channels are detected.



- Convert between HD standards
- Timeable Output
- Analog Audio Monitor Output
- Mirror Output Mode for On-Camera Talent
- Graticule and Safe Title Generator
- HDMI Output
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 1.485 Gb/s HD Serial Digital (SMPTE 274M, 292M or 296M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for 1.485 Gb/s |

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Type | HD Serial Digital 1.485 Gb/s SMPTE 274M or 296M-C |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 100 meters for HD (Belden 1694A) |

Automatic Input Cable Equalization

HD Standards Supported
- 1080i (SMPTE 274M -4,5,6) 50, 59.94 or 60 Hz
- 720p (SMPTE 296M -1,2,3) 50, 59.94 or 60 Hz
- 1080p (SMPTE 274M -9,10,11) 23.98, 24, 25 Hz
- 1080sF (RP211 -14,15,16) 23.98, 24, 25 Hz

### Monitor Output

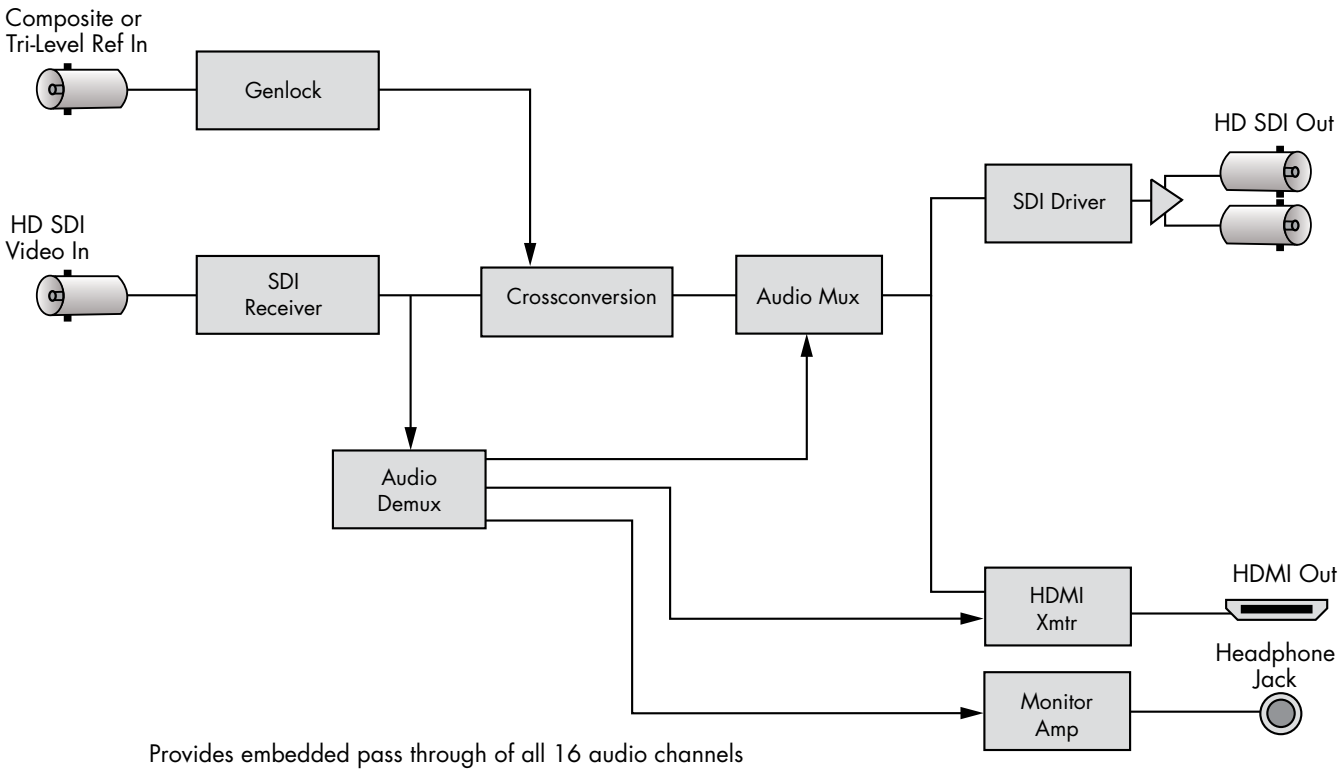
| | |
|---|---|
| Number | One |
| Connector | HDMI |
| Type | Follows SDI out |

### Audio Monitoring Output

| | |
|---|---|
| Number | One (select from eight channels) |
| Connector | 3.5 mm stereo mini jack |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 11 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |




Provides embedded pass through of all 16 audio channels

# BrightEye 94

## SD Aspect Ratio Converter

BrightEye 94 is a standard definition aspect ratio converter. You can easily convert signals from 4:3 to SD 16:9, and vice versa.

All vertical interval data and closed captioning are faithfully passed. Sixteen channels of embedded audio are supported. If the incoming video has embedded audio, the audio will be safely bypassed around the video processing and lipsync will be preserved. An external reference input allows genlock to a house reference.

Input selection, gain control, and test pattern controls are provided through the front panel interface. Audio presence LEDs indicate which channels are detected. Controls for crop, letterbox and pillarbox are accessed from the front panel or BrightEye Mac or PC software. A special Mirror Output Mode can be enabled, causing the output image to be flipped left to right for use with on-camera talent.

- SD ARC
- Timeable Output
- Mirror Output Mode for On-Camera Talent
- Graticule and Safe Title Generator
- HDMI Output
- Frame Sync
- 12 and 16 bit processing
- Passes Embedded Audio

## Specifications

### Analog Video Input

| | |
|---|---|
| Number | One |
| Type | Analog Composite PAL or NTSC |
| Resolution | Digitized at 12 bits |
| Impedance | 75 Ω |
| Return Loss | >40 dB |
| Input DC | +/-1 volt DC |
| Input Hum | <100 mV |

### Serial Digital Input

| | |
|---|---|
| Number | One |
| Signal Type | 270 Mb/s SD Serial Digital (SMPTE 259M) |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters for 270 Mb/s |

Automatic Input Cable Equalization

### Analog Video Output

| | |
|---|---|
| Number | One |
| Type | Composite PAL or NTSC |
| Return Loss | >40 dB |
| Output | DC <100 mV |

### Reference Input

| | |
|---|---|
| Number | One |
| Type | 1 V P-P Composite Video PAL or NTSC or Tri-Level Sync |
| Impedance | 75 Ω |
| Return Loss | >40 dB |

### Serial Digital Output

| | |
|---|---|
| Number | Two |
| Type | SD Serial Digital 270 Mb/s SMPTE 259M-C |
| Processing | 12 and 16 bit |
| Impedance | 75 Ω |
| Return Loss | >15 dB |
| Max Cable Length | 300 meters |

### Monitor Output

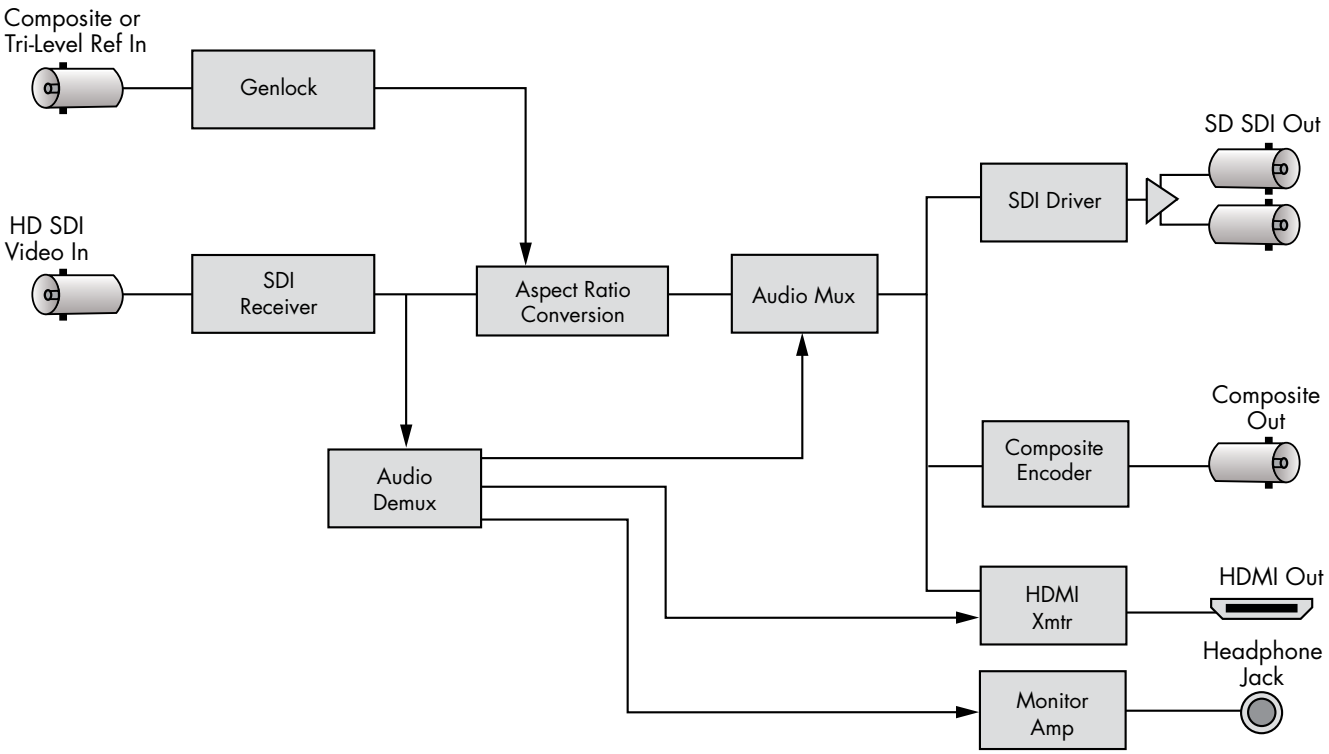
| | |
|---|---|
| Number | One |
| Connector | HDMI |

### Audio Monitoring Output

| | |
|---|---|
| Number | One (select from eight channels) |
| Connector | 3.5 mm stereo mini jack |

### General Specifications

| | |
|---|---|
| Size | 5.625" W x 1.7" H x 5.5" D (143 mm x 40 mm x 140 mm) including connectors |
| Power | 12 volts, 9 watts (100-230 VAC modular power supply not included) |
| Temperature Range | 0 to 40° C ambient |
| Relative Humidity | 0 to 95%, non-condensing |




Provides embedded pass through of all 16 audio channels

# Glossary

AES/EBU – The digital audio standard defined as a joint effort of the Audio Engineering Society and the European Broadcast Union. AES/EBU or AES3 describes a serial bitstream that carries two audio channels, thus an AES stream is a stereo pair. The AES/EBU standard covers a wide range of sample rates and quantizations (bit depths.) In television systems, these will generally be 48 KHz and either 20 or 24 bits.

AFD – Active Format Description is a method to carry information regarding the aspect ratio of the video content. The specification of AFD was standardized by SMPTE in 2007 and is now beginning to appear in the marketplace. AFD can be included in both SD and HD SDI transport systems. There is no legacy analog implementation. (See WSS).

ASI – A commonly used transport method for MPEG-2 video streams, ASI or Asynchronous Serial Interface, operates at the same 270 Mb/s data rate as SD SDI. This makes it easy to carry an ASI stream through existing digital television infrastructure. Known more formally as DVB-ASI, this transport mechanism can be used to carry multiple program channels.

Bandwidth – Strictly speaking, this refers to the range of frequencies (i.e. the width of the band of frequency) used by a signal, or carried by a transmission channel. Generally, wider bandwidth will carry and reproduce a signal with greater fidelity and accuracy.

Beta – Sony Beta SP video tape machines use an analog component format that is similar to SMPTE, but differs in the amplitude of the color difference signals. It may also carry setup on the luminance channel.

Bit – A binary digit, or bit, is the smallest amount of information that can be stored or transmitted digitally by electrical, optical, magnetic, or other means. A single bit can take on one of two states: On/Off, Low/High, Asserted/Deasserted, etc. It is represented numerically by the numerals 1 (one) and 0 (zero). A byte, containing 8 bits, can represent 256 different states. The binary number 11010111, for example, has the value of 215 in our base 10 numbering system. When a value is carried digitally, each additional bit of resolution will double the number of different states that can be represented. Systems that operate with a greater number of bits of resolution, or quantization, will be able to capture a signal with more detail or fidelity. Thus, a video digitizer with 12 bits of resolution will capture 4 times as much detail as one with 10 bits.

Blanking – The Horizontal and Vertical blanking intervals of a television signal refer to the time periods between lines and between fields. No picture information is transmitted during these times, which are required in CRT displays to allow the electron beam to be repositioned for the start of the next line or field. They are also used to carry synchronizing pulses which are used in transmission and recovery of the image. Although some of these needs are disappearing, the intervals themselves are retained for compatibility purposes. They have turned out to be very useful for the transmission of additional content, such as teletext and embedded audio.

CAV – Component Analog Video. This is a convenient shorthand form, but it is subject to confusion. It is sometimes used to mean ONLY color difference component formats (SMPTE or Beta), and other times to include RGB format. In any case, a CAV signal will always require 3 connectors – either Y/R-Y/B-Y, or R/G/B.

Checkfield – A Checkfield signal is a special test signal that stresses particular aspects of serial digital transmission. The performance of the Phase Locked-Loops (PLLs) in an SDI receiver must be able to tolerate long runs of 0's and 1's. Under normal conditions, only very short runs of these are produced due to a scrambling algorithm that is used. The Checkfield, also referred to as the Pathological test signal, will "undo" the scrambling and cause extremely long runs to occur. This test signal is very useful for testing transmission paths.

Chroma – The color or chroma content of a signal, consisting of the hue and saturation of the image. See also Color Difference.

Component – In a component video system, the totality of the image is carried by three separate but related components. This method provides the best image fidelity with the fewest artifacts, but it requires three independent transmission paths (cables). The commonly used component formats are Luminance and Color Difference (Y/Pr/Pb), and RGB. It was far too unwieldy in the early days of color television to even consider component transmission.

Composite – Composite television dates back to the early days of color transmission. This scheme encodes the color difference information onto a color subcarrier. The instantaneous phase of the subcarrier is the color's hue, and the amplitude is the color's saturation or intensity. This subcarrier is then added onto the existing luminance video signal. This trick works because the subcarrier is set at a high enough frequency to leave spectrum for the luminance information. But it is not a seamless matter to pull the signal apart again at the destination in order to display it or process it. The resultant artifacts of dot crawl (also referred to as chroma crawl) are only the most obvious result. Composite television is the most commonly used format throughout the world, either as PAL or NTSC. It is also referred to as Encoded video.

Color Difference – Color Difference systems take advantage of the details of human vision. We have more acuity in our black and white vision than we do in color. This means that we need only the luminance information to be carried at full bandwidth, we can scrimp on the color channels. In order to do this, RGB information is converted to carry all of the luminance (Y is the black and white of the scene) in a single channel. The other two channels are used to carry the "color difference". Noted as B-Y and R-Y, these two signals describe how a particular pixel "differs" from being purely black and white. These channels typically have only half the bandwidth of the luminance.

Decibel (dB) – The decibel is a unit of measure used to express the ratio in the amplitude or power of two signals. A difference of 20 dB corresponds to a 10:1 ratio between two signals, 6 dB is approximately a 2:1 ration. Decibels add while the ratios multiply, so 26 dB is a 20:1 ratio, and 14 dB is a 5:1 ratio. There are several special cases of the dB scale, where the reference is implied. Thus, dBm refers to power relative to 1 milliwatt, and dBu refers to voltage relative to .775V RMS. The original unit of measure was the Bel (10 times bigger), named after Alexander Graham Bell.

dBFS – In Digital Audio systems, the largest numerical value that can be represented is referred to as Full Scale. No values or audio levels greater than FS can be reproduced because they would be clipped. The nominal operating point (roughly corresponding to 0 VU) must be set below FS in order to have headroom for audio peaks. This operating point is described relative to FS, so a digital reference level of -20 dBFS has 20 dB of headroom before hitting the FS clipping point.

EDH – Error Detection and Handling is a method to verify proper reception of an SDI or HD-SDI signal at the destination. The originating device inserts a data packet in the vertical interval of the SDI signal and every line of the HD signal which contains a checksum of the entire video frame. This checksum is formed by adding up the numerical values of all of the samples in the frame, using a complex formula. At the destination this same formula is applied to the incoming video and the resulting value is compared to the one included in the transmission. If they match, then the content has all arrived with no errors. If they don't, then an error has occurred.

Embedded Audio – Digital Audio can be carried along in the same bitstream as an SDI or HD-SDI signal by taking advantage of the gaps in the transmission which correspond to the horizontal and vertical intervals of the television waveform. This technique can be very cost effective in transmission and routing, but can also add complexity to signal handling issues because the audio content can no longer be treated independently of the video.

Eye Pattern – To analyze a digital bitstream, the signal can be displayed visually on an oscilloscope by triggering the horizontal timebase with a clock extracted from the stream. Since the bit positions in the stream form a very regular cadence, the resulting display will look like an eye – an oval with slightly pointed left and right ends. It is easy to see from this display if the eye is "open", with a large central area that is free of negative or positive transitions, or "closed" where those transitions are encroaching toward the center. In the first case, the open eye indicates that recovery of data from the stream can be made reliably and with few errors. But in the closed case data will be difficult to extract and bit errors will occur. Generally it is jitter in the signal that is the enemy of the eye.

Frame Sync – A Frame Synchronizer is used to synchronize the timing of a video signal to coincide with a timing reference (usually a color black signal that is distributed throughout a facility). The synchronizer accomplishes this by writing the incoming video into a frame buffer memory under the timing direction of the sync information contained in that video. Simultaneously the memory is being read back by a timing system that is genlocked to a house reference. As a result, the timing or alignment of the video frame can be adjusted so that the scan of the upper left corner of the image is happening simultaneously on all sources. This is a requirement for both analog and digital systems in order to perform video effects or switch glitch-free in a router. Frame synchronization can only be performed within a single television line standard. A synchronizer will not convert an NTSC signal to a PAL signal, it takes a standards converter to do that.

Frequency Response – A measurement of the accuracy of a system to carry or reproduce a range of signal frequencies. Similar to Bandwidth.

H.264 – The latest salvo in the compression wars is H.264 which is also known as MPEG-4 Part 10. MPEG-4 promises good results at just half the bit rate required by the currently dominant standard, MPEG-2.

HD – High Definition. This two letter acronym has certainly become very popular. Here we thought it was all about the pictures – and the radio industry stole it.

HDMI – The High Definition Multimedia Interface comes to us from the consumer marketplace where it is becoming the de facto standard for the digital interconnect of display devices to audio and video sources. It supports a wide range of video formats and can carry digital audio. It is a bit serial interface that carries the video content in digital component form over multiple twisted-pairs. This gives it a lower cost of entry than SD or HD SDI, but cable length is much more limited. HDMI is closely related to the DVI interface for desktop computers and their displays.

IEC – The International Electrotechnical Commission provides a wide range of worldwide standards. Among them, they have provided standardization of the AC power connection to products by means of an IEC line cord. The connection

point uses three flat contact blades in a triangular arrangement, set in a rectangular connector. The IEC specification does not dictate line voltage or frequency. Therefore, the user must take care to verify that a device either has a universal input (capable of 90 to 230 volts, either 50 or 60 Hz), or that a line voltage switch, if present, is set correctly.

Interlace – Human vision can be fooled to see motion by presenting a series of images, each with a small change relative to the previous image. In order to eliminate the flicker, our eyes need to see more than 30 images per second. This is accomplished in television systems by dividing the lines that make up each video frame (which run at 25 or 30 frames per second) into two fields. All of the odd-numbered lines are transmitted in the first field, the even-numbered lines are in the second field. In this way, the repetition rate is 50 or 60 Hz, without using more bandwidth. This trick has worked well for years, but it introduces other temporal artifacts. Motion pictures use a slightly different technique to raise the repetition rate from the original 24 frames that make up each second of film—they just project each one twice.

IRE - Video level is measured on the IRE scale, where 0 IRE is black, and 100 IRE is full white. The actual voltages that these levels correspond to can vary between formats.

ITU-R 601 - This is the principal standard for standard definition component digital video. It defines the luminance and color difference coding system that is also referred to as 4:2:2. The standard applies to both PAL and NTSC derived signals. They both will result in an image that contains 720 pixels horizontally, with 486 vertical pixels in NTSC, and 576 vertically in PAL. Both systems use a sample clock rate of 27 Mhz, and are serialized at 270 Mb/s.

Jitter - Serial digital signals (either video or audio) are subject to the effects of jitter. This refers to the instantaneous error that can occur from one bit to the next in the exact position of each digital transition. Although the signal may be at the correct frequency on average, in the interim it varies. Some bits come slightly early, others come slightly late. The measurement of this jitter is given either as the amount of time uncertainty or as the fraction of a bit width. For 270 Mb/s SD video, the allowable jitter is 740 picoseconds, or 0.2 UI (Unit Interval – one bit width). For 1.485 Gb/s HD, the same 0.2UI spec corresponds to just 135 pico seconds.

Luminance - The "black & white" content of the image. Human vision had more acuity in luminance, so television systems generally devote more bandwidth to the luminance content. In component systems, the luminance is referred to as Y.

MPEG – The Moving Picture Experts Group is an industry group that develops standards for the compression of moving pictures for television. Their work is an on-going effort. The understanding of image processing and information theory is constantly expanding. And the raw bandwidth of both the hardware and software used for this work is ever increasing. Accordingly, the compression methods available today are far superior to the algorithms that originally made the real-time compression and decompression of television possible. Today, there are many variations of these techniques, and the term MPEG has to some extent become a broad generic label.

Metadata – This word comes from the Greek, meta means 'beyond' or 'after'. When used as a prefix to 'data', it can be thought of as 'data about the data'. In other words, the metadata in a data stream tells you about that data – but it is not the data itself. In the television industry, this word is sometimes used correctly when, for example, we label as metadata the timecode which accompanies a video signal. That timecode tells you something about the video, i.e. when it was shot, but the timecode in and of itself is of no interest. But in our industry's usual slovenly way in matters linguistic, the term metadata has also come to be used to describe data that is associated with the primary video in a datastream. So embedded audio will (incorrectly) be called metadata when it tells us nothing at all about the pictures. Oh well.

Multi-mode – Multi-mode fibers have a larger diameter core than single mode fibers (either 50 or 62.5 microns compared to 9 microns), and a correspondingly larger aperture. It is much easier to couple light energy into a multi-mode fiber, but internal reflections will cause multiple "modes" of the signal to propagate down the fiber. This will degrade the ability of the fiber to be used over long distances. See also Single Mode.

NTSC – The color television encoding system used in North America was originally defined by the National Television Standards Committee. This American standard has also been adopted by Canada, Mexico, Japan, Korea, and Taiwan. (This standard is referred to disparagingly as Never Twice Same Color.)

Optical – An optical interface between two devices carries data by modulating a light source. This light source is typically a laser or laser diode (similar to an LED) which is turned on and off at the bit rate of the datastream.

The light is carried from one device to another through a glass fiber. The fiber's core acts as a waveguide or lightpipe to carry the light energy from one end to another. Optical transmission has two very significant advantages over metallic copper cables. First, it does not require that the two endpoint devices have any electrical connection to each other. This can be very advantageous in large facilities where problems with ground loops appear. And secondly, and most important, an optical interface can carry a signal for many kilometers or miles without any degradation or loss in the recovered signal. Copper is barely useful at distances of just 1000 feet.

Oversampling – A technique to perform digital sampling at a multiple of the required sample rate. This has the advantage of raising the Nyquist Rate (the maximum frequency that can be reproduced by a given sample rate)

much higher than the desired passband. This allows the use of more easily realized anti-alias filters.

PAL – During the early days of color television in North America, European broadcasters developed a competing system called Phase Alternation by Line. This slightly more complex system is better able to withstand the differential gain and phase errors that appear in analog amplifiers and transmission systems. Engineers at the BBC claim that it stands for Perfection At Last.

Pathological Test Pattern – see Checkfield

Progressive – An imaging scanning technique that progresses through all of the lines of a frame in a single pass. Computer monitors all use progressive displays. This contrasts to the Interlace technique common to television systems.

Return Loss – An idealized input or output circuit will exactly match its desired impedance (generally 75 ohms) as a purely resistive element, with no reactive (capacitive or inductive) elements. In the real world, we can only approach the ideal. So, our real inputs and outputs will have some capacitance and inductance. This will create impedance matching errors, especially at higher frequencies. The Return Loss of an input or output measures how much energy is returned (reflected back due to the impedance mismatch). For digital circuits, a return loss of 15 dB is typical. This means that the energy returned is 15 dB less than the original signal. In analog circuits, a 40 dB figure is expected.

RGB – RGB systems carry the totality of the picture information as independent Red, Green, and Blue signals. Television is an additive color system, where all three components add to produce white. Because the luminance (or detail) information is carried partially in each of the RGB channels, all three must be carried at full bandwidth in order to faithfully reproduce an image.

ScH Phase – Used in composite systems, ScH Phase measures the relative phase between the leading edge of sync on line 1 of field 1 and a continuous subcarrier sinewave. Due to the arithmetic details of both PAL and NTSC, this relationship is not the same at the beginning of each frame. In PAL, the pattern repeats every 4 frames (8 fields) which is also known as the Bruch Blanking sequence. In NTSC, the repeat is every 2 frames (4 fields.) This creates enormous headaches in editing systems and the system timing of analog composite facilities.

SDI – Serial Digital Interface. This term refers to inputs and outputs of devices that support serial digital component video. This generally means standard definition at 270 Mb/s. The use of "HD-SDI" is used to indicate High Definition Serial Digital Video at 1.485 Gb/s.

SMPTE – The Society of Motion Picture and Television Engineers is a professional organization which has done tremendous work in setting standards for both the film and television industries. The term "SMPTE'" is also shorthand for one particular component video format - luminance and color difference.

Single Mode – A Single mode (or mono mode) optical fiber carries an optical signal on a very small diameter (9 micron) core surrounded with cladding. The small diameter means that no internally reflected lightwaves will be propagated. Thus only the original "mode" of the signal passes down the fiber. A single mode fiber used in an optical SDI system can carry a signal for up to 20 kilometers. Single mode fibers require particular care in their installation due to the extremely small optical aperture that they present at splice and connection points. See also Multi-mode.

TBC – A Time Base Corrector is a system to reduce the Time Base Error in a signal to acceptable levels. It accomplishes this by using a FIFO (First In, First Out) memory. The incoming video is written into the memory using its own jittery timing. This operation is closely associated with the actual digitization of the analog signal because the varying position of the sync timing must be mimicked by the sampling function of the analog to digital converter. A second timing system, genlocked to a stable reference, is used to read the video back out of the memory. The memory acts as a dynamically adjusting delay to smooth out the imperfections in the original signal's timing. Very often a TBC will also function as a Frame Synchronizer. See also Frame Sync.

Time Base Error – Time base error is present when there is excessive jitter or uncertainty in the line to line output timing of a video signal. This is commonly associated with playback from video tape recorders, and is particularly severe with consumer type heterodyne systems like VHS. Time base error will render a signal unusable for broadcast or editing purposes.

Timecode – Timecode, a method to uniquely identify and label every frame in a video stream, has become one of the most recognized standards ever developed by SMPTE. It uses a 24 hour clock, consisting of hours, minutes, seconds, and television frames. Originally recorded on a spare audio track, this 2400 baud signal was a significant contributor to the development of video tape editing. We now refer to this as LTC or Longitudinal Time Code because it was carried along the edge of the tape. This allowed it to be recovered in rewind and fast forward when the picture itself could not. Timecode continues to be useful today and is carried in the vertical interval as VITC, and as a digital packet as DVITC. Timecode is the true metadata.

Tri-Level Sync – For many, many years, television systems used composite black as a genlock reference source. This was a natural evolution from analog systems to digital implementations. With the advent of High Definition television, with even higher data rates and tighter jitter requirements, problems with this legacy genlock signal surfaced. Further, a reference signal with a 50 or 60 Hz frame rate was useless with 24 Hz HD systems running at film rates. Today we can think of composite black as a bi-level sync signal – it has two levels, one at sync tip and one at blanking. For HD systems, Tri-Level Sync, which has the same blanking level (at ground) of bi-level sync, but the sync pulse now has both a negative and a positive

element. This keeps the signal symmetrically balanced so that its DC content is zero. And it also means that the timing pickoff point is now at the point where the signal crosses blanking and is no longer subject to variation with amplitude. This makes Tri-Level Sync a much more robust signal and one which can be delivered with less jitter.

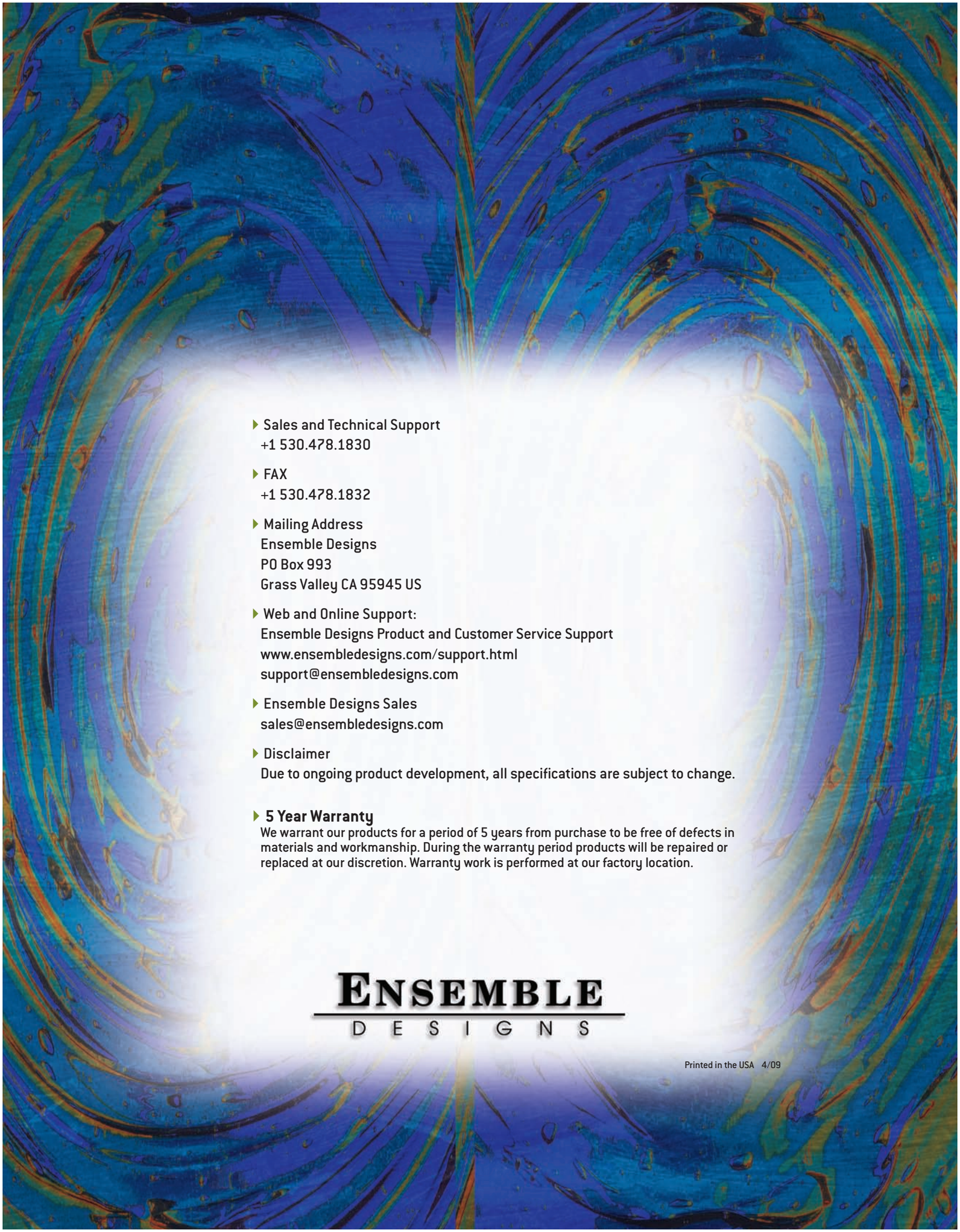
USB – The Universal Serial Bus, developed in the computer industry to replace the previously ubiquitous RS-232 serial interface, now appears in many different forms and with many different uses. It actually forms a small local area network, allowing multiple devices to coexist on a single bus where they can be individually addressed and accessed.

WSS – Wide Screen Signaling is used in the PAL/625 video standards, both in analog and digital form, to convey information about the aspect ratio and format of the transmitted signal. Carried in the vertical interval, much like closed captioning, it can be used to signal a television receiver to adjust its vertical or horizontal sizing to reflect incoming material. Although an NTSC specification for WSS exists, it never achieved any traction in the marketplace.

Word Clock – Use of Word Clock to genlock digital audio devices developed in the audio recording industry. Early digital audio products were interconnected with a massive parallel connector carrying a twisted pair for every bit in the digital audio word. A clock signal, which is a square wave at the audio sampling frequency, is carried on a 75 ohm coaxial cable. Early systems would daisychain this 44.1 or 48 kilohertz clock from one device to another with coax cable and Tee connectors. On the rising edge of this Work Clock these twisted pairs would carry the left channel, while on the falling edge, they would carry the right channel. In most television systems using digital audio, the audio sample clock frequency (and hence the 'genlock' between the audio and video worlds) is derived from the video genlock signal. But products that are purely audio, with no video reference capability, may still require Word Clock.

YUV – Strictly speaking, YUV does not apply to component video. The letters refer to the Luminance (Y), and the U and V encoding axes using in the PAL composite system. Since the U axis is very close to the B-Y axis, and the V axis is very close to the R-Y axis, YUV is often used as a sort of shorthand for the more long-winded “Y/R-Y/B-Y”.

Y/Cr/Cb – In digital component video, the luminance component is Y, and the two color difference signals are Cr (R-Y) and Cb (B-Y). Y/Pr/Pb – In analog component video, the image is carried in three components. The luminance is Y, the R-Y color difference signal is Pr, and the B-Y color difference signal is Pb.

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